THE

AMERICAN JOURNAL

OF

PHARMACY.

JULY, 1836.

ORIGINAL COMMUNICATIONS.

ART. XIII.—APPARATUS FOR MAKING INFUSIONS.

By Robert Alsop, London, Honorary Member of the Philad. Coll. Pharm.

A more uniform and effective mode of preparing the medicinal infusions than that in common use, together with some simple means for their preservation, so as to admit of their extemporaneous use, have long appeared to me problems of some importance in practical pharmacy. My time is so much engaged in other concerns as to leave little leisure for scientific pursuits, except in those departments which the ordinary course of business presents; I have pleasure, however, in contributing my mite, through the medium of this Journal, towards the advancement of my favourite study.

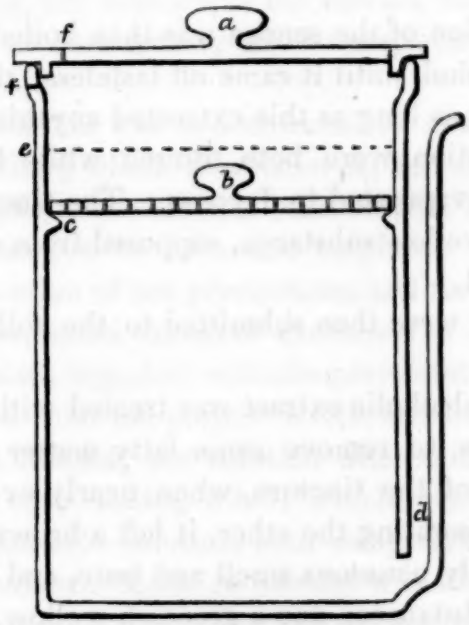
Every one must have remarked, when preparing infusions in the common mode, without repeated agitation, the appearance of a denser stratum at the bottom of the vessel, highly charged with the soluble and active part of the substance employed; this dense solution cannot but obstruct the complete extraction, by cutting off contact with the unsaturated portion of fluid, and I have endeavoured to present the medicinal substance under circumstances to which this objection will not apply.

To this end, I propose the use of an earthenware vessel, similar in construction to one that I have myself employed,

a rough section of which I subjoin. This jar should be rinsed with boiling water before each time of using, to avoid loss of heat as much as possible; the ingredients to be infused are then to be placed upon the perforated plate, and boiling water poured over them; employing a vessel of such dimensions that the required quantity may sufficiently overtop the ingredients after allowing for the portion likely to be absorbed. During the maceration, the contiguous fluid becoming charged with soluble matter, sinks through the perforations, and unsaturated water will supply its place as long as any thing further remains which water has the power of dissolving. It is of great advantage to maintain the maceration at a gentle heat, which is readily accomplished by placing the vessels upon a heated plate near the fire, as the top of an iron oven, &c. &c., which also renders convenient the application of my mode of preserving them. This consists *in the removal of atmospheric pressure*, and with it the greater part of the air, generally present in a state of diffusion or solution in the water, by which the seeds of the cryptogamous byssi, or mould, which commonly form in infusions, are developed and supported. With this view, when the maceration has continued the time prescribed, the infusion should be strained *while hot*, and immediately transferred to bottles, provided with accurately ground stoppers, which are to be made perfectly *full;* allowing the stopper to displace its own bulk of the liquid. I secure the stoppers from being mismatched by tying each to its own bottle by a piece of string of convenient length. As the infusion cools, a partial vacuum is formed by its contraction, which is the more complete the higher the temperature at which it is bottled, and the freer the infusion from diffused air. The same object may be effected by the use of a common bottle and perforated cork, closing immediately the aperture from which the displaced fluid escapes, by sealing it with sealing-wax. On this principle I have for several months preserved my infusions with great facility and advantage; and by the latter mode, with corks, I preserved Infusion of Cusparia from the fourth month, (April,) of last year until with-

in a few weeks of the present time—a period of about nine months, comprising the whole of a hot summer. When opened, it was found quite free from mould or putrescence, perfect in odour and taste, and fit for use.

I am aware that this principle has long been acted upon in the culinary department, for the preservation of unripe gooseberries, &c., and that a somewhat similar mode has been patented, for the preservation of dressed meats, soups, &c.; but I am not aware of its having been heretofore applied to pharmaceutical purposes, in which I apprehend it admits of extensive application.



(*a*) The lid.

(*b*) The perforated plate on which the substance to be infused is to be placed.

(*c*) A ledge which supports the plate.

(*d*) A spout which rises close to the side, to prevent it from being broken off.

(*e*) The water line.

(*f*) String-holes, by which the lid may be tied to the jar.

ART. XIV.—ON POLYGALA SENEGA. By Richard Price.

(*Extract from Inaugural Thesis.**)

Supposing, from the analogy in the appearance of the internal structure of the senega and ipecacuanha, that similar treatment might extract their active principles, I submitted a quantity of the root to the process for procuring Emetia, and also to several modifications of it, without obtaining anything satisfactory.

A fresh portion of the senega was then boiled in successive portions of alcohol, until it came off tasteless; the residue was boiled in water as long as this extracted anything. The tincture and decoction were both filtered while hot, and after cooling, were evaporated to dryness. The tincture deposited as it cooled, a yellow substance, supposed from examination to be wax. [No. 1.]

The extracts were then submitted to the following experiments:

First. The alcoholic extract was treated with ether, in successive portions, to remove some fatty matter which floated on the surface of the tincture, when nearly evaporated. By afterwards evaporating the ether, it left a brown residue, having an extremely nauseous smell and taste, and separable into two distinct substances; one a greenish yellow, semifluid oil, soluble in cold alcohol and ether, insoluble in water, not appreciably volatile, though when heated, giving off a slight smell resembling senega. The other, a dark brown, nearly solid fatty matter, insoluble in cold alcohol or ether, soluble in those fluids when boiling, and precipitating as the solution cools.

* We owe it to the authors of this, and the subsequent paper, to state that the only reason for their omission in the last volume, was owing to our having mislaid the extracts we made, soon after they were placed in our hands.

Second. The residue, after treatment with ether, was digested in cold alcohol, by which a portion of whitish matter was precipitated. The clear tincture was evaporated to dryness, [No. 2,] with the intention of dissolving in water for further examination: but having noticed in the January number of the Journal of the Philadelphia College of Pharmacy, a process for preparing hyoscyamine, and, judging from my former experiments, it might answer with senega, I submitted the alcoholic extract to some experiments founded on that process.

1st. The extract of No. 2 was boiled in alcohol; the solution by filtering, left nearly half the extract, which was insoluble in alcohol, of an intensely acrid taste, and nearly colourless. [No. 3.]

The clear solution was concentrated in a water bath, and digested with lime, which was removed, and dilute sulphuric acid added in slight excess: the solution still remaining very dark, was treated with lime and sulphuric acid as before. After the separation of the precipitates, and further concentration of the solution, an excess of carbonate of soda in powder was added, which, together with the precipitate occasioned by it, were pressed from the mother water, and boiled in alcohol of 41 degrees Baumé; the solution filtered, and the mother water treated with boiling ether, which, when filtered, was added to the alcoholic solution, both being turbid and of a yellowish green colour. Lime in powder was added, which precipitated some yellow colouring matter, leaving the solution green. The lime was separated by the filter, and the solution boiled with washed animal charcoal, filtered and evaporated to dryness. The residue was nearly insoluble in cold water, partially soluble in alcohol and ether, the residue soluble in water, appearing like sugar. The alcoholic solution evaporated, the residue has a slight acrimony with a sweet taste resembling good liquorice; the ether appears to have dissolved only some resinous matter.

2d. The mother water, after treating with ether, still having a somewhat acrid taste, was boiled in alcohol, which dis-

solved but a small portion of it; the solution, freed from insoluble matter, was treated with lime and sulphuric acid, as before, then with carbonate of soda, and alcohol; the substance obtained was precisely similar to that from No. 1.

3d. The precipitate No. 2, was treated with boiling alcohol, which dissolved a yellow substance analogous to wax, leaving a black insoluble substance, which burned without flame, leaving a small, white residue.

4th. The precipitate No. 3, being insoluble in either cold or hot alcohol, or ether, was dissolved in boiling water. The solution reddens litmus, forms a brownish precipitate with solution of sulphate of iron, but not with gelatine. A portion of it, treated with lime and dilute sulphuric acid, becomes gelatinous as soon as a slight excess of acid was added. Neither the solution or precipitate retaining any acridity.

5th. Another portion of the third precipitate, dissolved in water, was boiled with magnesia, filtered, and on adding dilute sulphuric acid, became gelatinous; but was redissolved by adding a slight excess of magnesia, then filtered to separate the magnesia, and evaporated to dryness. The dry mass, boiled in strong alcohol, the solution filtered, had the taste and sensible properties of senega, precipitating as it cooled, a white substance, leaving the liquid green; this, when evaporated, left a greenish white residue, insoluble in ether, soluble in alcohol and water, which developes more strongly the acridity of the substance. The solution being neither acid nor alkaline, was slowly evaporated to dryness, leaving the substance unchanged. The precipitate also tasted slightly acrid, but was so small I could not separate it from the filter.

The active principle, in the impure state in which I have obtained it, appears to be neither acid nor alkaline, is soluble in water and alcohol; insoluble in ether; is not precipitated by alkalies or their carbonates; precipitated by subacetate of lead and sulphuric acid; forming with the latter a gelatinous mass, insoluble in alcohol or water.

ART. XV.—ON SOME PREPARATIONS OF IRON.

By James Hopkins.

(*Extract from Inaugural Thesis.*)

Sulphate of Iron. All the pharmacopœias give formulas for its preparation, but differ much in regard to the quantities of the articles employed. Those of the United States and London direct eight ounces of iron and eight ounces of acid. To this there is no material objection; there is, however, an unnecessary excess of iron. I have found by experiment that eight ounces of acid are completely neutralized by four and a half ounces of iron.

No more water should be used than is really necessary, as in proportion to the weakness of the solution the evaporation is prolonged; under any circumstances, water in weight equal to nine times that of the acid employed will be sufficient; and where a moderate degree of heat can be retained in the solution until it is filtered, a still smaller quantity will answer.

The effervescence generally ceases before the acid is entirely neutralized; it may be renewed by a slight application of heat. If the solution contain but little sediment, it may be clarified quickly by passing it through a funnel, in the neck of which is slightly pressed a portion of cotton.

The evaporation of the liquid requires some caution, for if it be exposed to too high a temperature it becomes charged with a reddish yellow precipitate, (the subsulphate of the peroxide.) A long exposure to even a moderate temperature produces the same effect. It should be placed in a broad, flat dish, and submitted to an even temperature of about 180° of Fahrenheit; the crystals should be perfectly dried and put into a glass stoppered bottle. The French pharmacopœia of Ratier asserts that the sulphate of iron (of commerce,) which contains the sulphates of copper and alumina, may be purified by boiling the solution with pure iron filings, straining and

crystallizing. This may do for copper and alumina, but will not answer for many other impurities.

Among the preparations into which it enters, are the compound iron mixture, and the compound iron pills of the pharmacopœia; the former being similar to the celebrated antihectic mixture of Dr. Griffith of England, the latter composed principally of the same ingredients, intended as a substitute for the mixture—the latter are pretty generally prescribed in this city. The directions given for making them are hardly explicit enough.

They are: Take of myrrh in powder, two drachms; carbonate of soda—sulphate of iron, each one drachm; syrup a sufficient quantity; rub the myrrh with the carbonate of soda, then add the sulphate of iron, and again rub them; lastly, beat them with the syrup so as to form a mass, to be divided into eighty pills.

When the carbonate of soda and the sulphate of iron, in crystals, are mixed with the myrrh, it is very difficult to powder them, the sulphate more particularly; much of which, as the mixture becomes moist by trituration, remains in coarse particles, defended from the action of the pestle by the myrrh.

I have, in making them, usually powdered the several ingredients previous to mixing. In moist weather, the addition of syrup is unnecessary, sufficient water of crystallization being afforded by the mutual decomposition of the salts to form a pillular mass.

The Precipitated Carbonate of Iron.—When a solution of carbonate of soda is mixed with one of the protosulphate of iron, a double decomposition ensues, and a precipitate (white if a pure protosulphate is used, but green if the sulphate in its ordinary state is employed,) is formed, which is a protocarbonate of iron in combination with water. By exposure to the air it loses the water, and most of the carbonic acid, and acquires oxygen from the air, forming a reddish brown peroxide, united with a variable quantity of protocarbonate of iron.

The formulas of the different pharmacopœias, as in the case

of the sulphate, vary considerably in the relative proportions of the ingredients used in its formation. The United States pharmacopœia orders six ounces of carbonate of soda, to eight ounces of sulphate of iron; the Edinburgh, five ounces of carbonate of soda to four ounces of sulphate of iron; and the Dublin, twenty-six parts of carbonate of soda to twenty-five parts of sulphate of iron.

In making a portion, I found the precipitation to be continued after I had added eight ounces of carbonate of soda to eight ounces of sulphate of iron in solution, being two ounces more than is ordered by the United States pharmacopœia. From this result, I would suggest that equal quantities of the two salts be used.

Great difference in the colour, and, according to Mr. Phillips, in the composition of the product is caused by slight variations in the process for making the precipitate.

According to Mr. Phillips, when precipitated in hot water, washed in hot water, and dried by steam, it contained 14.5 per cent. of carbonic acid, and was of a chocolate brown colour; when dried in the air it contained the same quantity of carbonic acid, and was of a yellowish brown colour; when precipitated in cold water and dried by steam it contained one per cent. of carbonic acid, and was of a reddish brown; when dried in the air, no carbonic acid, and was of a yellowish brown colour.

In repeating some of Mr. Phillips' experiments I have found the difference in colour of the several products to be very considerable. But the quantity of carbonic acid, though evidently greater in the product of the first mentioned process, did not differ as widely from that of the latter as in Mr. Phillips' experiments.

It cannot be of great consequence which process is followed, but as the first is the most convenient, and as the product contains the highest proportion of carbonic acid, (to which some think the activity of the preparation is proportioned,) it is to be preferred. Eight ounces of each of the salts in crystals yield about three ounces of the precipitate.

The Muriated Tincture of Iron. Whenever iron is administered in the liquid form, the tincture of the muriate is the preparation usually resorted to. It possesses, in addition to its properties as an active chalybeate, that of being acceptable to the stomach, and easy of administration. There can be no just reason for its variance in strength, as is frequently the case; much circumspection is certainly required in its preparation; but when due care is taken, it will generally be obtained of nearly the same strength.

There are several causes that may influence its preparation; any difference in the strength of the acid, allowing the base to be always the same, must necessarily vary the product; any mixture of the peroxide of iron, obtained from the protosulphate by heat, with the base, may vary the strength. Equal quantities of two tinctures, one made from the precipitated carbonate and one from the peroxide, obtained from the protosulphate, yielded for the first 40 grains of peroxide of iron, and for the latter, 17 grains. Exposure to the air is likely also to weaken the tincture. The protoxide of the protomuriate being changed by the absorption of oxygen to the peroxide, which, requiring a larger proportion of acid for saturation, is partly precipitated; there is more or less of this precipitate according to the quantity of protomuriate in the tincture.

A tincture made from a peroxide resulting from the precipitated carbonate, deprived of its carbonic acid by heat, did not precipitate during several weeks exposure.

The only certain test of its strength is to ascertain the quantity of peroxide it contains. This may be done by adding a solution of caustic potash to a given quantity of the tincture, until it ceases to precipitate. The peroxide is thrown down in the form of a bulky hydrate; this is to be thoroughly washed and dried. 1000 grains of the tincture, made according to the national pharmacopœia, yielded 79 grains of the peroxide of iron. This very nearly agrees with Mr. Phillips' test of a tincture prepared by himself.

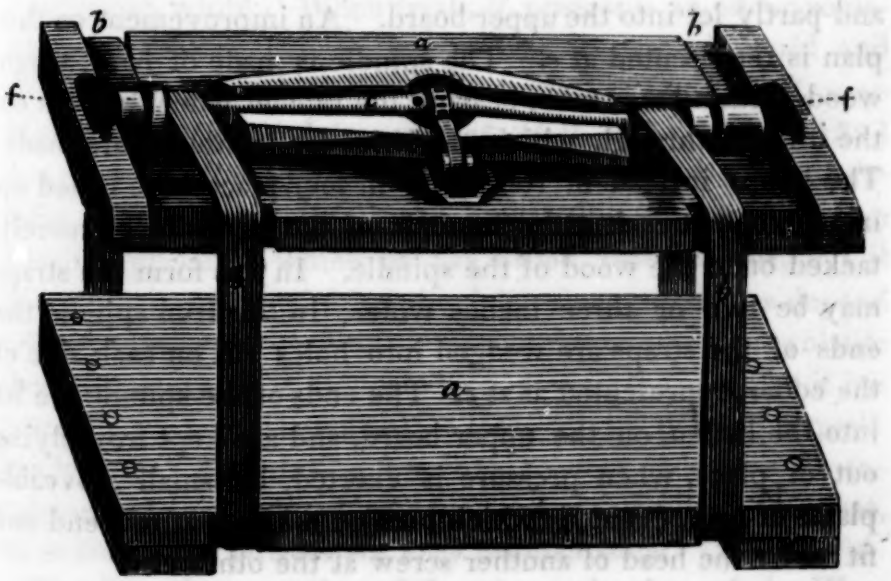
Mr. Phillips states that muriatic acid of the officinal specific

gravity, dissolves all the precipitated carbonate directed except one scruple. I have never been able to make it take up more than five and two-thirds ounces. Indeed if it did take up the whole, it should yield a somewhat larger proportion of peroxide than it really does.

The muriated tincture of iron is used in medicine in almost all the cases where a chalybeate is advisable.

ART. XVI. ON A PORTABLE BOTANICAL PRESS. By Robert Peter, M. D., Lexington, Ky., Correspondent of the American Journ. Pharm.

The idea of this press was suggested by seeing one from Cincinnati, made by Dr. Locke, upon which this is a manifest improvement. It is intended for pressing and drying plants on botanical excursions; and supercedes the old plan of boards with straps and buckles.



(*a. a.*) Boards 12 by 18 inches, with battens on the ends.

(*b. b.*) Straps passing under the lower board to make the pressure by being rolled around the spindle *c*. These straps are of very strong woollen webbing, such as the saddlers use in the construction of reins, &c.

(*c*) Spindle of iron, with a ratchet wheel in the centre, having holes in which to place the end of the handle *d*, in order to turn it around. The spindle is protected by strips of wood, and partly let into the upper board. An improvement on this plan is represented at *e*. The spindle is made of hard, tough wood, with a brass tube, bearing the ratchet wheel, driven on the middle, through which the holes for turning it are made. The straps instead of rolling up in four places, are rolled up in two, one at each end; the ends of the straps being merely tacked on to the wood of the spindle. In this form the straps may be two or three inches wide. In the iron spindle the ends of the straps are wedged into holes cut on each side of the collar, represented as at *é*. The ends of the spindle are let into the batten on the upper board, and are kept from flying out of place, when pressure is exerted, by small moveable plates of iron, (as at *f*,) which turn on a screw at one end and fit under the head of another screw at the other end.

ART. XVII.—MEDICO-BOTANICAL NOTICES. No. X.

Passiflora.—This extensive and beautiful genus of plants is almost peculiar to tropical countries, very few of its species being found in the more temperate regions. They are all climbing plants, with alternate, simple, generally lobate leaves, and axillary flowers, which are succeeded by a sort of apple or pepo, of a pleasant and refreshing taste, on which account they are much esteemed in warm climates. From the beauty and peculiarity of their flowers, they are also an object of interest to the horticulturist.

In a medical point of view, they likewise deserve attention, as some of the species are endowed with energetic properties, more especially the P. *quadrangularis*, a native of the isle of Bourbon, but extensively cultivated in the West Indies for the sake of its fruit, which is considered as one of the most grateful of the tropical productions, having a luscious, but at the same time a subacid taste.

The root is long and slender, having a blackish epidermis; the cortical portion is of a claret red colour, and the wood of a yellowish white. When fresh, it possesses an odour somewhat resembling that of the radish; its taste is acrid and astringent, without bitterness. According to Dr. J. B. Ricord Madianna, (*Ann. Lyceum Nat. Hist. New York* i. 129,) this root, in a fresh state, is a violent acro-narcotic, acting rapidly and energetically on the brain; this he attributes to a peculiar principle which he has called *Passiflorine*, but it does not appear certain that the deleterious properties depend solely on the presence of this body, but rather on a more volatile constituent, which is dissipated on drying the root, for it has been satisfactorily shown that it loses all its poisonous qualities by age. An infusion has been recommended for the expulsion of tæniæ, but, added to the danger attendant on its use, its anthelmintic powers are very problematical.

The P. *rubra*, a native of Jamaica and other of the West

India islands, also appears to be endowed with somewhat the same characters. Dr. WRIGHT, (*Med. Plants, Jamaica,*) states that the roots and young shoots are a poison to hogs, and also that a Dutch physician in Jamaica employed the flowers as an anodyne with great advantage; this property was confirmed by other practitioners who found them a mild and safe opiate in fevers, where opium itself was inadmissible. The mode of administration is to infuse twenty-four of the blossoms in hot water; this infusion, when cold, to be taken in two doses; twelve of the berries eaten produce the same effect. It is evident, however, that great caution is requisite in the employment of this remedy, as from its poisonous effects, an overdose might be attended with serious consequences.

The flowers of another species, the P. *fœtida*, are also esteemed as efficacious in catarrh and other diseases of the respiratory organs, and an infusion of the stems is said by POUPEE DESPORTES to be a powerful emmenagogue.

No trials have been made with our native species, though it is probable from their virose smell, that they will be found analogous in their properties to the above.

We have noticed these plants from the fact that DECANDOLLE has stated that "no species of the Passifloreæ is employed in medicine, nor does it appear that they are endowed with any striking properties," and LINDLEY says that nothing is known respecting their qualities except the edible character of the fruit.

Cerbera.—In a late notice of the C. *Tanghin*, (*Am. Jour. Pharm.* i. 190,) we stated that it was the most virulent vegetable poison known, but omitted to say that it is the *Tanghinia venenifera*, DUPETIT THOUARS. POIRET, however, considers that it is identical with the C. *manghas*. The nuts have been analyzed by HENRY, jr., and found to contain a limpid, mild, fixed oil, a peculiar crystalline substance, extremely poisonous, (*Tanghine*) &c. &c.

All the other species, seven of which are enumerated by

Persoon, also appear to be highly poisonous. The C. *thevetia*, a native of the West Indies, has been experimented upon by Dr. Madianna, (*Ann. Lyceum Nat. Hist.* i. 86,) who found the juice highly energetic, causing death in animals in a short time, with all the symptoms produced by the acro-narcotics. He is of opinion that the active principle is hydrocyanic acid, but it is more probable that its powers are owing to the presence of the peculiar substance above alluded to. Descourtilz states that two grains of the bark are equivalent to a full dose of cinchona, in the treatment of paroxysmal fevers. (*Flor. Med. des Antilles*, iii. 40.)

The C. *ahouia*, found in Brazil, is said by Orfila to bear a very poisonous nut, acting powerfully in small doses as an emetic, and in larger quantities producing death. The C. *manghas*, a native of several parts of the East Indies, has long been known as a medicinal agent. According to Ainslie, (*Mat. Ind.* ii. 260,) it is the *Manghas lactescens Burmann*, (*Zeyl.* 150 t. 79 f. 1,) and *arbor lactaria*, Rumphius, (*Amboyn.* ii. 243, t. 81,) who speaks of the bark being eminently cathartic. It also appears to be the C. *salutaris*, Loureiro, (*Flor. Coch. Chin.*, i. 134,) and is noticed by Horsfield, (*Asiatic Journ.*, March, 1819;) he states that the leaves and bark are considered by the Javanese as active purgatives, and that the fruit is externally applied as a cataplasm in diseases of the skin. When taken internally, this fruit produces symptoms closely resembling those caused by stramonium.

Anacardium occidentale.—This tree is a native of the West Indies, where it attains a height of from twenty to twenty-five feet. Its fruit, which is known under the name of *Cashew apple*, is very peculiar, as this apple is nothing more than a large, pyriform, succulent receptacle, which supports a reniform nut of about an inch in length. The apple is edible, having an agreeably rough and sweet taste. The nut is covered with a hard but brittle shell, between which and the kernel is a very bitter and caustic oil, which, when applied to the skin, causes an erysipelatous eruption; it is very vola-

tile, for in roasting the nuts, if great caution be not used in avoiding the fumes, they will produce swelling and inflammation of the face. The kernel itself is perfectly bland, and somewhat resembles a chesnut in taste.

The shell of the nut was analyzed by CADET, and found to contain much gallic acid, tannin, an extractive matter, a gum resin and a green colouring principle. This resin has been examined by M. DE MATTOS, (*Journ de Pharm.* xvi. 625.) He states its taste is acrid and caustic, and when applied to the skin produces immediate vesication, and might advantageously supply the place of cantharides, where strangury is feared. It has also been given internally as a drastic purgative in doses of two grains; in smaller quantities, it acts as a stimulant to the gastric organ. It can be readily procured by treating the nutshells with alcohol, evaporating and washing the residue with hot water, to remove any gallic acid or tannin.

But this tree is still more interesting for the gum which it furnishes in considerable abundance. It is stated in the *Jamaica Phys. Journ.*, that it resembles the finest gum Arabic, is almost transparent, of a light straw colour, perfectly tasteless and brittle. LONG (*Hist. Jamaica*) says that a tree "annually transudes large quantities, viz.—ten or twelve pounds" of this gum.

Rhus metopium.—This species is found in many of the West India islands; and, according to DESCOURTILZ, (*Flor. Med. des Antill.* ii. 49) is used as an astringent in diseases of the bowels; a gum also exudes from it, which is known in Jamaica by the name of *Hog gum*, and is said by a writer in the Journal above quoted, to be a useful demulcent in various forms of disease, especially colica pictorum, and disorders of the respiratory organs; some cases are cited of its efficacy in these complaints, which show that it is evidently a valuable article, and deserving of further trials. The mode in which it was administered, was by mixing one teaspoonful of the fresh juice with two ounces of boiling water, the dose of which was a teaspoonful every fifteen or twenty minutes. In large

doses it acts as an emeto-cathartic. It retains its properties for a considerable period, if prepared in the following manner:—to every two ounces of the gum add an ounce of boiling water, stir well, and mix with half an ounce of strong rum, strain and keep in a well closed bottle. The dose is a teaspoonful.

Ionidium Marcucci.—In the last volume of this journal we gave a short notice of this plant, since which we have been favoured by Dr. HULINGS with dried specimens, a drawing of the plant, the report made to the Colombian government on the subject, and also with the description published to aid the search for it. As every thing relating to this plant is of importance, if on further trial it should be found to fulfil the high powers attributed to it, we have also inserted a memoir by Dr. BANCROFT, which gives a condensed view of all that is known respecting it.

In this paper, as before mentioned, he considers the plant to be a new species differing from the I. *parviflora*, and the drawing in our possession agrees perfectly with his description, as do the specimens received from Dr. MUTTER, and one of those from Dr. HULINGS, labelled as coming from Riobamba, where Mr. MARCUCCI obtained it. On the other hand, the official description referred to, terms it I. *parviflora*, and describes that plant, added to which most of the specimens accompanying it, are certainly different from the plant of Dr. BANCROFT, being fruticose and not procumbent, with smooth peduncles,—thus agreeing with the I. *parviflora*.

It is, however, highly probable that they are possessed of identical properties, as it is well known that the roots of all the species of this genus are emeto-cathartic in an eminent degree, and produce precisely the train of symptoms attributed to the *Cuichunchilli*.

Coulteria Tinctoria.—According to Dr. MACFADYEN, (*Jamaica Phys. Journ.*, April, 1834,) this plant, which is a native of several parts of South America, has been introduced

into Jamaica, where it has thriven even in the most parched and arid spots. As this shrub is tolerably hardy, it would in all probability succeed in many parts of our southern states, in situations in which scarcely anything else would grow. In Jamaica it soon comes into bearing, and its crops last through a greater part of the year.

The pods which are similar to those of the *Cæsalpinia coriaria*, contain tannin and gallic acid in very large proportions, and may hence be used not only as a substitute for oak bark in tanning, but also are capable of supplying the place of the best Aleppo galls. R. E. G.

ART. XVIII.—REMARKS ON SOME COMMON IMPURITIES IN MEDICINES, AND THE MEANS OF OBVIATING THEM.

By Wm. R. Fisher, Baltimore.

Plumbi Acetas. The best crystallized and whitest specimens of this salt in commerce contain much carbonate of lead and dirt, and are unfit for internal administration as medicine. Hence it has long been a practice with me to recrystallize and refine the crude salt, (if this term be allowable,) before dispensing it as a medicine. It has been asserted as an ascertained fact, that the acetate of lead, when pure, does not produce lead disease, or rather that the *carbonate* is the only direct poison of lead;* if this be true, there is a direct responsibility incurred by the pharmaceutist, who through ignorance or neglect furnishes to his customers an acetate of lead containing so noxious an agent. The internal use of lead during the prevalence of the Cholera in this city in 1834, was very extensive, and the experience of one physician at least, who freely administered it, confirms the opinion that pure acetate of lead does not produce lead poison. I do not, of

* Ducatel's Abridgement of Christison, p. 148.

course, propose to confirm or deny the assertion, but I do unhesitatingly affirm that the commercial sugar of lead is unfit for medical use; and hence I wish to impress upon those whose business it is to dispense prescriptions, that it is a matter of duty with them to re-crystallize and purify even the best *looking* salt which they can buy; the operation is attended with little expense, and trouble should be no consideration with the faithful pharmaceutist, who is fully sensible of the responsibility involved in the exercise of his profession.

Sulphate of Zinc. This is a highly useful member of the Materia Medica, and one which is as frequently employed as almost any other; very frequently for internal use. Some experience has satisfied me that it can seldom, if ever, be bought pure, even in its best looking condition. Tincture of galls will almost invariably show the presence of iron in it. Hence the pharmaceutist who would vend a pure article must either make it for himself, or purify the commercial salt; if he adopt the former plan he will obtain, from the formula of the United States Pharmacopœia, a handsome, pure article, by careful crystallization, rejecting the latter portions of his mother waters. The latter mode, that of purifying the salt of commerce, is attended with more trouble, and is perhaps quite as expensive; the iron must be separated either by immersing sheets of zinc in the solution required to be purified, which after a long time will decompose the sulphate of iron and precipitate its oxide; or the same object may be accomplished in less time by adding small portions of chloride of lime to the solution, which, by its reaction on the water of the solution, is converted into muriate of lime, and allows the iron to become peroxidized by combining with the oxygen set at liberty when the muriatic acid is formed; the resulting muriate of lime remains dissolved in the last mother waters, which must be thrown away; the solution must be heated, and the chloride added in solution, so long as red oxide of iron falls; if any sulphate of lime be formed, being insoluble, it is separated when the solution is filtered preparatory to crystallization.

It may be objected to this, that such nicety is not required, and that the presence of so small a quantity of iron in the preparation cannot possibly injure its effects as a medicine. This may be true, or it may not; I do not intend to discuss it, and will admit that absolute purity is not so imperatively called for as in the salt before treated of; but we all profess to sell *pure* medicines, and a sulphate of zinc containing iron, is not *pure sulphate of zinc.* The time occupied in preparing this notice it is believed has been well engaged if it serve to attract the attention of any one to a fact which had hitherto escaped his notice. As to the modes recommended, the author speaks from his own experience with them.

Carbonate of Soda. The extensive manufacture of artificial barilla, as it is called, has introduced into our markets a carbonate of soda, containing a sulphuret of soda, which is exceedingly unpleasant, to say the least. My attention was once or twice called to the smell of sulphuretted hydrogen arising from carbonate of soda, before I paid much regard to it, passing it by as the result of accident, or neglect in cleaning out the mortars after they had been used for some previous preparation; but upon one occasion when I saw that no cause of this kind could have produced it, I at once recognised the cause; at least, such a cause as was adequate, in my opinion, to account for it. Having seen no reference to this subject in any of the books, it occurred to me that it could not prove uninteresting to your readers to have some account of it. The artificial barilla of this country is made by the decomposition of sulphate of soda, by means of charcoal and lime. The effect of this combination when heated is first to convert the sulphate into sulphuret of soda, which is decomposed by the lime, leaving as the product, soda and sulphuret of lime, mixed with carbonaceous matter, of which there is always an excess. This is the theoretical effect, but in practice, some sulphuret of soda is always left, which it is found impracticable to separate, at least with due regard to the economy which prevails in large manufacturing establishments. I have

been informed that in France, when the artificial barilla is designed for the production of carbonate of soda, that means are always employed thoroughly to remove the sulphuret, and hence that French carbonate, whether made from native barilla or artificial is always freer from this contamination. From the same source I learn that the artificial barilla made in this country is all designed for the use of soap manufacturers, and that therefore the same care is not observed in its preparation; the wants of that class requiring the alkali uncombined, render but little preparation necessary in the manufacture of the barilla, and it is of course an object with the manufacturer to furnish the article at its lowest price.

This consideration should not prevail with our profession, and care should therefore be taken to avoid the unpleasant results, which might follow the employment of carbonate of soda containing sulphuret of soda.

With regard to the tests necessary to detect its presence, I should think the disagreeable odour itself would be sufficient; but at all events, the presence of any sulphuret may be made manifest with a soluble salt of silver or lead.

Spt. Etheris Nitrici. In preparing some of this ether a short time since, the mixture was inflamed, and burned for several minutes within the retort. The nitrate of potassa and sulphuric acid had been mixed, and when about an ounce of alcohol was poured in upon them, an explosion took place with sufficient force to throw a small glass funnel, then in the mouth of the retort, some distance; the mixture within blazed up and burned for some minutes, as I have above stated. I have never noticed any effect approaching this before, and merely note it as a caution to others who may be employed in making this preparation.

ART. XIX.—PHARMACEUTICAL NOTICES. NO. XIV.

Mel Rosæ. The following is recommended in a late French publication as giving a very astringent preparation, of a good colour and consistence:

Petals of red roses	1½ pounds,
Rose water	8 pounds.

These are to be mixed, and placed in a still, heat applied, and the distillation continued until about twelve ounces of a very aromatic fluid has passed over. The residue is to be subjected to pressure, and the fluid obtained, filtered. This filtered liquid is to be mixed with ten pounds of well clarified syrup of honey, and evaporated till it marks 31°, when the twelve ounces of distilled fluid is to be added, and the whole strained.

Peroxide of Gold. The preparation of the peroxide of gold, for medicinal purposes, is variously advised by different authors. Thus CHRISTIEN directs (*Ann. Soc. Med. de Mont.* xxii. 166,) the hydrochlorate of this metal to be precipitated by means of subcarbonate of potash, taking care to avoid any excess. This process, however, is attended with many difficulties, as part of the gold is reduced and precipitated with the oxide, &c.

MAJENDIE recommends the use of barytes, and other chemists the oxide of zinc, but neither of these agents, it would appear from some late experiments on the subject, will afford as large or pure a product as calcined magnesia. M. COTTEREAU states that the following mode of operating will be found advantageous in every respect.

An excess of magnesia is to be boiled with a diluted solution of hydrochlorate of gold, till the solution loses its colour; the whole is then to be filtered and the precipitate well washed, the result, which is aurate of magnesia, is to be treated

with an excess of diluted nitric acid, which removes all the magnesia and leaves the oxide in a pure state. This is to be again well washed and dried between sheets of bibulous paper, but without compression or exposure to light or heat. It is pulverulent, inodorous and of a brown colour. Light acts on it very rapidly, and it must therefore be always kept in opaque bottles.

Action of Charcoal on some of the Bitter Extracts. The employment of charcoal as a decolourizing agent is so frequently resorted to, that it is a matter of some consequence to ascertain whether in some cases, in removing the colouring principle, it does not at the same time act on other constituents. It was several years since asserted by DUBURGA, that if the tincture of gentian be treated with charcoal, that it lost all its bitterness, whilst the tincture of centuary was not acted upon by this substance. In consequence of this statement, Dr. HOPFF made a series of comparative trials on a number of vegetable extracts, and found that whilst some remained unaffected, others were deprived of almost all their previous bitterness; this was particularly the case with chamomile, simarouba, Iceland moss, &c.

Nux vomica and false angustura were not affected by the use of small portions of animal charcoal; but if an excess be employed, and the digestion continued for some time, they lost almost all bitterness. This subject still presents a wide field for experimental inquiry, especially as regards the effect of this agent on the peculiar principles of vegetables, and more particularly on such as are remarkable for their bitterness, as quinia, &c. Dr. HOPFF does not mention whether the extract of nux vomica, thus deprived of one of its most sensible qualities, still retained its other qualities unimpaired. Might not the strychnia, in thus losing its bitterness, also lose its poisonous properties.

Medicated Waters.—Most of the aromatic medicated waters of the United States Pharmacopœia are ordered to be

made, by impregnating the water with the appropriate volatile oil, by trituration with magnesia. This is certainly the simplest and least expensive process for preparing them; and in many cases, the resulting article, in a medical point of view, is fully equal to that obtained by distillation; though this is not always the case, owing to the difficulty of procuring the essential oils in a pure state. In other respects, however, medicated waters made in this manner are far inferior to those procured by distilling from fresh plants, and in some cases totally different products are obtained by the two processes. Thus it has been shown by M. SOUBEIRAN, (*Journ. de Pharm.* xvi. 619,) that orange flower water, distilled from the flowers, and that made with the essential oil of these flowers, (neroli,) differed widely from each other in many important characters; as, for instance, in permanency; the distilled water retaining its odour and other properties after exposure to the air, whilst the factitious article was speedily rendered inert.

There are few pharmaceutic preparations whose nature is so little understood as the distilled waters, for though in some cases they may be nothing more than a diffusion of the volatile oil of the plant through water, it has not been satisfactorily shown whether this oil is merely in a state of infinite division in the vehicle, whether it undergoes certain changes, or lastly whether other principles may not be associated with it. In the case above cited, M. SOUBEIRAN has proved that the latter is the case, the distilled water containing an aromatic body, which that made with the volatile oil does not. Again, the distilled waters of bitter almonds, peach kernels, &c. owe their principal medicinal properties to the presence of principles which did not pre-exist in a formed state, but which were formed during the process by the combined action of the heat and water.

Tinctura Opii. The different Pharmacopœias of Europe and the United States agree very nearly in their formulas for the preparation of this important article, though at the first glance it would appear that the reverse is the case; their proportions are one part of opium to twelve parts of weak alcohol.

Thus the pharmacopœias of Edinburg, Vienna and Amsterdam, as well as the formulary of BRUGNATELLI, order one ounce of opium to the pound of weak alcohol. Now at Rome as well as in Great Britain, Holland and Germany, the pound, apothecaries' weight, contains twelve ounces; and hence, although the value of the pound varies much in these different countries, still as the ounce forms the twelfth part of it, the proportions of opium and alcohol remain the same.

The London, Dublin and United States Pharmacopœias order in the proportion of two ounces and a half of opium to two pints of weak alcohol, which gives almost the same ratio of twelve to one. The codex of Paris prescribes one part of the aqueous extract of opium to twelve parts of alcohol at 22°. The Lisbon formula, however, is widely different from the above; not containing much larger proportions of opium than paregoric elixir. The Danish, one part opium to forty-eight of alcohol; the Brunswick dispensatory, and that of VAN MONS, one to eight.

The relative strength of the alcohol used, is also much the same; thus the 22° B. of the French codex agrees very nearly with the diluted alcohol of the other formulas; that of the London college having a sp. gr. 0.930, or 20° B.; the Dublin, 0.919 = 21,75°; those of Edinburgh and the United States, 0.935, or 19° B. On the other hand, the Antwerp orders alcohol of 15°. R. E. G.

Rochelle Salts. A quantity of epsom salts, in large crystals, having a strong resemblance in form to the crystallized tartrate of potash and soda, has lately been offered in this market as Rochelle salts. The deception is easily detected by the taste, or by adding to a solution of them carbonate of potash or soda, either of which will separate the magnesia from its sulphate. It is believed that they have been profusely crystallized in this form to deceive the unwary, and for the purposes of gain. Their history cannot be traced further than that one lot came from New York; whether they are manufactured in that city, or further eastward, is not satisfactorily as-

certained. It is due to the respectable house who purchased some of this article to say, that they immediately declined selling it as Rochelle salts, upon being informed of its true character.

It is believed that the sulphates of magnesia and soda have been frequently used to adulterate the powdered Rochelle salts and Seidlitz mixture; being mixed in such quantities with the true article as to affect the quality without changing the taste enough for the deception to be discovered in that way. The difference in the value of the Rochelle salts, no doubt, is the inducement to this unprincipled conduct.

When a lot of Rochelle or Seidlitz is suspected to be thus contaminated, it can be readily discovered by adding a small quantity of the solution of nitrate of barytes to a solution of the suspected article, a precipitate being thus formed of sulphate of barytes.

Sup. Carb. Sodæ. Sup. carb. sodæ is said to be adulterated by means of the sulphate of soda. Physicians and druggists should be on their guard in purchasing this article, and especially that which is imported from England. J. S.

SELECTED ARTICLES.

ART. XX. RESEARCHES ON SUGAR, MOLASSES, &c.

By A. Bouchardat.

One of the most interesting parts of chemistry, is that relating to the transformation of one immediate principle into another. If, in particular, we consider the neutral ternary principles furnished by vegetables, we discover bodies which are formed of the same elements, in proportions so nearly similar, that oftentimes, to use the words of Berzelius, we may refer the differences stated to exist, to errors of observation, we find these bodies, I say, so widely dissimilar in their physical properties that it could scarcely be supposed that woody fibre, starch and sugar belonged to the same group. But it has been found that the composition of these substances was very analogous, and their transformation under various influences into each other, has confirmed the justness of classing them together.

1. Of the species composing the genus Sugar.

All bodies which are transformed by fermentation into carbonic acid and alcohol, must be arranged in the genus Sugar, which will thus comprehend three species, 1. Cane sugar; 2. Grape sugar; 3. Mushroom sugar; Maple, Beet and Cane sugars form one and the same variety; but we shall see that there are several varieties of grape sugar.

At the present time I shall notice only the action of acids and alkalies on sugars, and of the different kinds of sugar on each other, as these are the most interesting in a practical point of view.

The following experiments will show how far I agree with

other chemists, and in what points I differ, especially with M. Malagutti, with whom, however, it is probable I should be more in unison, if he had operated comparatively on the several varieties of grape sugar.

Twenty-nine grammes of cane sugar were dissolved in fifty grammes of water, acidulated with five grammes of sulphuric acid, the whole was boiled in a water bath, at the same time with a similar mixture in which sugar of starch replaced that of the cane. A few minutes boiling were sufficient to cause a deposit of ulmic acid in the flask containing the cane sugar, whilst the solution of the starch sugar was scarcely coloured; but, after boiling for an hour, both flasks contained a deposit. The quantity of acid was too great in this experiment. I dissolved in several flasks, each containing fifty grammes of water and one of sulphuric acid; 1st, ten grammes of cane sugar; 2d, ten grammes of crystallized grape sugar, procured by the action of sulphuric acid on cane sugar; 3d, ten grammes of crystallized grape sugar, obtained from raisins; 4th, ten grammes of crystallized grape sugar, arising from the action of sulphuric acid on fecula. The deposit of ulmic acid began to form after a few minutes' boiling, in the first flask; and soon afterwards occurred in the second; a longer time elapsed before it became visible in the third; whilst in the fourth a few flakes only were perceptible after an ebullition of six hours. This experiment was variously modified by augmenting and diminishing the proportion of acid, always operating comparatively in the same water bath, and it was found that the formation of ulmic acid followed an invariable order; 1st, cane sugar; 2d, grape sugar, procured by the action of sulphuric acid on cane sugar; 3d, grape sugar; 4th, and differing essentially, sugar from starch. This experiment is remarkable, as it proves that when the decomposing effect of the sulphuric acid has been arrested for some time, as regards cane sugar, it afterwards operates on it much more slowly than if it had exercised a continued action. The elements become arranged in a more settled manner, and thus are better enabled to resist the operation of the acid. It also demonstrates that well

characterized varieties of grape sugar exist, founded on constant and positive characters.

Experiments have also proved to me that all the acids act in the same manner on the sugars, differing only in energy.

If the ultimate action of acids on the sugars is tolerably well known, it is by no means so as regards their intermediate influence; as the different changes that are induced before the formation of ulmic acid are but imperfectly appreciated.

I boiled a solution of cane sugar, made with three parts of water and $\frac{1}{300}$ of nitric, sulphuric and hydrochloric acids; and checked the action as soon as the slightest tinge of colour began to manifest itself in either of the three flasks; the acid was then saturated with lime water, and I obtained on evaporation a white, uncrystallizable sugar, of very great sweetness, without the slightest bitterness. No signs of crystallization appeared.

I successively diminished the quantity of acid, and with the nitric even in the proportion of 0,001 obtained an uncrystallizable product.

All the fixed acids I operated with, as the phosphoric, malic, tartaric, oxalic, citric, &c., produced the same effect. It must, however, be observed, that the proportion of acid was augmented in the ratio of their saturating power, with water saturated with sulphurous acid; the action also was not fully developed if the liquid syrup was kept for any length of time. In this case I remarked the formation of crystalline plates, which were merely the rudiments of crystals of cane sugar, mixed with a large proportion of uncrystallizable syrup and acetic acid; if the ebullition be prolonged, another effect is joined to that of the acid, that of heat; if the quantity of acid be increased, there is a formation of acetates, which are with difficulty got rid of, and which deteriorate the results.

A long continued boiling of the syrup produces the same effect as the acids; but, to obtain a syrup which is wholly uncrystallizable, this action must be prolonged for upwards of sixty hours, whilst with the acids a few minutes are usually sufficient.

Thus the acids before converting cane sugar into grape sugar, transform it into an uncrystallizable sugar, having a much sweeter taste than cane sugar, from which it is made.

I also made a comparison of the alcoholic fermentations of two equal parts of cane sugar, one transformed into uncrystallizable sugar, the other not; the proportions of carbonic acid were alike in both cases.

I subjected the uncrystallizable syrup arising from the foregoing experiments to a heat of 140° for four hours, after having added $\frac{1}{125}$ of sulphuric acid of 66°. The acid was diluted in a quantity of water equal to twice the weight of the syrup, and after being mixed with it, lime was added to saturation; the syrupy fluid lost much of its sweet taste on evaporation; it afforded sugar after having been left undisturbed for a few days; I separated the uncrystallized portions by means of alcohol; the remainder was a large proportion of well crystallized grape sugar.

This operation succeeded equally well with the other acids, their quantity being increased or diminished according to their energy; if the temperature be raised above 140° great attention must be paid to the process for reasons presently to be stated.

Acids also convert cane sugar into grape sugar, without the assistance of heat, but it requires a much longer time; this fact has been observed by all pharmaceutists in their acid syrups, and is noticed by M. Boullay in his dissertation on ulmine.

If instead of $\frac{1}{125}$ of sulphuric acid $\frac{1}{25}$ be added to the uncrystallizable syrup, and the heat be raised to 212°, a liquid of a dark brown colour is obtained after a few minutes boiling; this liquid on being saturated with lime affords no signs of crystals; after being evaporated, it assumes the form of a brown molasses, having a bitter as well as sweet taste. It loses but little of its colour by the action of animal charcoal, and the syrup thus purified never crystallizes. The dark colour is not owing to a solution of ulmic acid in the syrup; for I have boiled this acid with sugar, and only produced a light

brown tint; it is a conversion of uncrystallizable grape sugar into a new uncrystallizable syrup, which, as will hereafter be seen, is readily obtained by acting on grape sugar by means of the alkalies.

Molasses of commerce. I made a comparative examination of a great number of specimens of different kinds of molasses of commerce, and found their nature very variable; they most commonly consist of a mixture of all the sugars into which cane sugar can be converted, namely: 1st, cane sugar dissolved in the uncrystallizable syrups; 2d, an uncrystallizable syrup which can be converted into grape sugar by the acids; 3d, a black, uncrystallizable sugar, resulting from an alteration of the grape sugar; 4th, in most cases there ought to be grape sugar resulting from the action of the free acids of the sugar cane, or beet on the cane sugar; but I have never been able to extract it without recourse to the use of acids; whilst with these agents, the greatest portion of the *rich* molasses, that is those containing the most cane sugar, and the first variety of uncrystallizable sugar, can be converted into grape sugar.

I should add that *heat* alone will not convert cane sugar into grape sugar; it first changes into an uncrystallizable syrup, and afterwards with time and an increase of the heat above 230°, it is transformed into the second variety, without my ever having been able to separate sugar in the intermediate state of grape sugar.

Action of Alkalies. To appreciate this action, great care is necessary, and all attendant circumstances are to be taken into the account. Not to cite well known facts, sugar heated with potash to a certain temperature, affords ulmic acid; and at another, it furnishes oxalic acid; in contact with anhydrous lime, it affords, as has lately been shown by Fremy, jr., acetone, metacone and carbonic acid. In fact, many of the discordant results obtained by different chemists may have arisen from a want of attention to similar discrepancies of con-

ditions. Many experiments have been made on the action of lime on cane sugar; this action is the more interesting as it is connected with all the manufacturing operations to which sugar is subjected; but the action of this base on the other kinds of sugar is less known.

The oldest experiments are those by Daniel, the proprietor of a sugar refinery at London; he announced that when a solution of lime in sugar is left undisturbed for some months, a very remarkable change takes place in it; a hydrated carbonate of lime is formed, and the solution loses its properties, changing into a jelly resembling that of starch; it requires from nine to twelve months to produce this. It is evident that the sugar experimented upon by Daniel contained foreign substances, for Pelouze has shown that the carbonic acid is furnished by the air, and that as long as any lime remains in the liquid, no decomposition of the sugar takes place; it has also been proved that a chemically pure solution of sugar is not altered by age if not exposed to the light.

Preceding chemists have studied the action of lime water at ordinary temperatures; but as it comes in contact with sugars at various degrees of heat in the manufacture of sugars, it becomes necessary to study its action under these circumstances. I have operated on all the kinds of sugar above enumerated, and may state as the results obtained, that the varieties of grape sugar all act identically with lime, hence we shall merely distinguish between cane and grape sugar.

On the 15th of January, I exposed a solution of one part of cane sugar in four parts of water with an excess of lime, in a well closed bottle, to a heat of 110°, until the 19th of March. At this time the supernatant fluid was decanted, carefully saturated with sulphuric acid and filtered; the product on evaporation afforded crystals of cane sugar. On the same 15th January a similar solution, in a carefully closed bottle, was put aside, and not examined till the 20th of September; there was no formation of hydrated carbonate of lime as in the experiments of Daniel and Pelouze, as the fluid was protected from the action of the air; the solution on evaporation furnished

crystals of cane sugar; hence the transformation noticed by the first writer was certainly not owing to the action of the lime.

So much lime is dissolved in a solution of sugar in water, that when it is saturated by sulphuric acid, it forms a solid mass from the quantity of sulphate of lime thus formed. I often employ in my laboratory this solution of lime in sugar and water, when the presence of the sugar has no influence on the desired results.

On the 6th of January, I placed solutions of the different kinds of grape sugar with an excess of lime in well closed vessels, and exposed them to a heat of 110° till the 19th of March. During the first few days, the solutions became dark coloured, and this phenomenon successively augmented; I removed the excess of lime by means of carbonic acid, evaporated the fluid, and obtained a brown extractiform mass, without saccharine taste, but extremely bitter, and which was soluble in both water and alcohol, and was not susceptible of alcoholic fermentation. I intend to study this with care, as I am inclined to believe that this substance is the antecedent to ulmic acid. It is produced during the alteration which takes place when grape sugar is converted into uncrystallizable sugar by means of acids; I have seen a very small portion of this substance render a large quantity of grape and even cane sugar, uncrystallizable.

Berzelius contradicts the assertion so generally made, that lime changes grape sugar to a brown colour, unaided by heat. The 30th January, I made a solution of 100 grammes of grape sugar in 50 grammes of water, containing an excess of lime, and suffered the mixture to remain undisturbed at the ordinary temperature, until the third of April; a slight precipitate of a rose colour was formed above the excess of lime; the fluid itself was amber coloured; by saturation with sulphuric acid, it became sensibly brown; on being filtered and evaporated, it afforded an uncrystallizable product.

All the grape sugars gave similar results; with the sugar of

diabetes not entirely pure, the calcareous deposit was of a very beautiful rose colour.

Action of Sugars on Sugars.—There is an experiment which has been much more thought of by adulterators than by chemists. This is crystallizing cane and starch sugar together, so as to present an uniform appearance. But the following experiments show that this cannot be done.

On the 23d of May, I dissolved 20 grammes of sugar obtained from starch in 32 grammes of water, and left the syrup to evaporate spontaneously in a hot and dry place; ten days afterwards there was no trace of crytallization. On the 20th June, crystals similar to those of cane sugar were visible in the midst of a viscous fluid, but the quantity was small.

I also boiled equal parts of cane sugar and grape sugar with animal charcoal, and obtained a perfectly clear syrup, of a pleasant taste, but not as sweet as before the operation; the mixture was left undisturbed for two months; crystallization gradually took place, and at last the whole formed a solid mass. In this case it was not the cane sugar that crystallized, but the grape; and the quantity of uncrystallizable sugar that remained, did not equal one-fifth of the cane sugar added; hence, by the mere effect of boiling, the cane sugar was transformed into grape sugar. Numerous experiments have proved to me, that the uncrystallizable sugar which remained, was a mixture of the two sugars.

APPLICATION OF THESE EXPERIMENTS TO THE MANUFACTURE OF SUGARS.

Manufacture and Refining of Cane and Beet Sugar.—I have shown that lime, even at the boiling point of syrups, exercises no injurious effect on cane sugar; these experiments clearly explain the advantageous use of it in sugar works. I have also ascertained that the soluble calcareous salts in like manner exercise no deteriorating influence; but this is not the case with acids in a state of great dilution; they first convert crystallizable sugar into an uncrystallizable white sugar, and

on the quantity being augmented, into grape sugar, and finally into an uncrystallizable sugar, which appears to result from the union of an uncrystallizable brown matter, &c. There is also another kind of uncrystallizable sugar, resulting from the action of cane sugar on grape sugar. As soon as sugar has descended one degree in the scale, there is no means of restoring it to its place; it can be still further deteriorated, and here our knowledge respecting it ceases.

It is then of the highest importance in the manufacture of cane and beet sugar, to saturate the free acids as soon as possible, to destroy their influence, and also to keep the beet roots as short a time as convenience will allow; for, as the vital force diminishes in these roots, the chemical action increases, causing a deterioration of the sugar; and this takes place much more rapidly than is generally supposed, especially if the roots contain nitrate of potash; we have already noticed the injurious effects of nitric acid, and according to Berthollet it is always found in a free state in a fluid containing a free acid and nitrate of potash. Great progress has been made in the manufacture of beet sugar, but there exists 0.10 of sugar in the roots, and only 0.6 have been obtained by the most expert manufacturers, though there is every reason to believe that uncrystallizable sugar does not exist naturally in them, but is the product of the deterioration of the root from age, or errors in the process of extraction.

Sugar from Starch.—If the manufacture of beet sugar has nearly arrived at perfection in France, this is far from being the case with sugar from starch. There was, till lately, nothing produced but a dark syrup of a disagreeable taste; since the researches of Biot, Payen and Perroz, however, this manufacture has much improved, and the products from Neuilly and especially those of M. Beudant, are very satisfactory in many respects.

The use of malted barley to make syrup of starch, is not as advantageous as was supposed; in fact it is very difficult to always procure malt of the same quality, and the omission of

a single precaution, may render the whole operation unsuccessful; much more syrup altered by sulphuric acid is sold for syrup of dextrine than is thought. But all the conditions necessary to full success in this operation, are not yet practised in manufactories. I will briefly enumerate them: 1st, it is better to employ a small proportion of sulphuric acid, and to prolong its action, but it must not be saturated until the transformation is complete; this may be ascertained by pouring into a small quantity of the fluid, about three times its bulk of alcohol; no precipitate should take place; 2d, the excess of acid must be saturated as soon as the transformation is complete, for if suffered to remain, it reacts on the sugar; 3d, the use of steam is much preferable to that of fire; 4th, the saturation and clarification demand particular attention; it is here that most manufacturers fail; if too much lime be added to saturate the acid, the sugar is rapidly blackened and altered; it is therefore better to leave the syrup somewhat acid than to overstep the mark. The choice of a substance to clarify the syrup much embarrasses manufacturers; some employ animal charcoal; others black schist; others again a mixture of both; but always with different results; some maintain that these agents contain either small portions of lime, or alkali, or sulphurets, and very minute quantities of either are sufficient to colour the syrup during evaporation, and to injure its crystallization. I have always employed with the greatest success the charcoal resulting from the action of potash on blood or horns, as furnished by the makers of Prussian blue; this should be first treated with muriatic acid and then thoroughly washed with water. This charcoal has a powerful decolourizing effect on starch sugar and may be purchased at a low rate, as the manufacturers have no sale for it, except as a manure.

By following the above rules, a beautiful sugar may be made, well crystallized, very white, having a purely sweet taste, and containing no uncrystallizable sugar.

Journ. de Pharm.

ART. XXI.—OBSERVATIONS ON THE PLANT NAMED CUICHUNCHULLI, AND ITS USE AS A REMEDY IN THE DISORDER CALLED MAL DE SAN LAZARO, OR COCOBAY.

By E. N. Bancroft, M. D., Fellow of the Royal College of Physicians of London.

The attention of the public throughout Columbia has of late been excited by accounts published in various journals relating to a plant named Cuichunchulli,* which is stated to have afforded very great benefit in the disorder there usually called Mal de San Lazaro, and here Cocobay, and even to have effected its cure; and as this is one of the most deplorable diseases that can afflict the human race, and is also deemed one of the least tractable, I feel persuaded that no apology will be requisite for bringing to the notice of this meeting some authentic reports on the subject, together with such additional information concerning both the plant itself, whose botanical characters I have been able to ascertain, and its properties, as it has been in my power to collect from different quarters or by personal observation.

It appears that a Jesuit of Quito, named Velasco, a native of Riobamba, in that province, who was afterwards expelled with the rest of his brethren from the Spanish Dominions, and subsequently allowed to retire to Italy, had occupied himself in writing a history of Quito, which however he was deterred from publishing by reason of the unremitting persecution kept up against the whole order of Jesuits, particularly by the Court of Spain. At his death the work came into the hands of another Ex-Jesuit, executor to Velasco, but, from similar

* This is the nearest approach that can be made in Spanish Orthography to the proper, *i. e.* Indian mode of pronouncing the word, but it is faulty in the penultimate syllable. It should be sounded as consisting of five syllables, and spelt for English pronunciation Coo-y-choon-jool-ye, for French, Cou-y-tchoune-djouilli, and for Italian, Cu-y-ciun-giu-gli.

apprehensions, it was never brought to light. At length, a Columbian, Senor Modesto Larrea, being in Italy, fell in with that executor, and received from him the original manuscript of Padre Velasco, which he carried back with him to Quito. Of this history some notice was soon afterwards given in a newspaper published under the title of "Gazeta de Quito," No. 33, and among other passages quoted from it was the following account of the plant already mentioned.

"The Cuichunchulli," a name signifying, in the language of the Incas, bowels of a Guinea pig, *tripa de Cuy*, "is like a small whitish slender nerve, without any leaf, that rises from beneath stones and fastens itself to their surface. There is scarcely any plant more powerful. Its virtues, though well known to the Indians, were unknown to the Spaniards until the year 1754, when an Indian, as a singular favour, revealed them to a lay-Jesuit," (*i. e.* a man-servant in a convent of Jesuits) "who was suffering under confirmed lepra" (Elephantiasis tuberculata) "with all the symptoms and appearances of a Lazar, and was considered by the physicians as being in a hopeless state. He gave him half a drachm (un adarme) of the nerve-like filament, ground and mixed with wine, but warned him first to receive the Sacraments. Its operation, upwards and downwards, was attended with extreme agony during 24 hours, (con agonias mortales,) but the surface of his body then became clean and dry (enxuto y seco.) A few days afterwards, he began to cast his skin piecemeal, (arrojar la piel a pedazos) and recovered perfectly. Of all which I was an eye-witness (ocular testigo) in the city of Cuenca."

Some time after the publication of this extract, it was copied into a newspaper printed at Bagota in 1829, called the Echo of Tequendama, No. 5, and through this paper it came in the course of the same year to the knowledge of a practitioner at Maracaybo, Senor Manuel de Aroche, formerly a medical officer in the Spanish Army, whose desire to make trial of the Cuichunchulli induced him to request the assistance of various friends to procure it for him; but it was not till near the end of 1833 that he succeeded in getting the plant, in consequence

of an application for it which Messrs. Casanova of that city had made to their relation, Colonel Casanova at Guyaquil, from their anxiety to have the new remedy administered to one of the members of their respective family then afflicted with the Mal de San Lazaro. Immediately on receiving the Cuichunchulli, Senor de Aroche commenced giving it first to a person of colour, named Jacopo Puche, who had been long and greatly affected with the disorder just mentioned, and afterwards to Senor Angel Casanova, the individual above alluded to, and kept a journal of the principal occurrences he observed in each patient during their treatment. Of this journal a copy is before me, written and signed by that practitioner, which General Montilla brought hither from Maracaybo in March last, when on his way to England as Envoy from the State of Venezuela to the British Court, and very kindly put into my hands; and as I believe it to be the first authentic account drawn up by a professional man that has yet appeared of the effects of the Cuichunchulli in the Mal de San Lazaro, I conceive that it will be more satisfactory to the Profession generally, that the whole of this interesting document, which is of but moderate length, should be submitted to them, than that it should be suppressed or even curtailed; I therefore give it entire. It is however proper here to observe, that the package received by Messrs. Casanova from their cousin, contained no stems, leaves, or flowers, but roots only, which agreed in appearance with the description of the plant as above quoted from Velasco's history.

DIARY OF THE EFFECTS OBSERVED IN PUCHE.

This patient began to take the Cuichunchulli on the 17th of October, 1833, in daily doses of half a drachm of the plant in powder, diluted in two spoonsful of Sherry wine. Within a few hours of taking the first dose, there was a sensible increase in the urine and in the perspiration, accompanied with a disagreeable feeling in the epigastric region.

18*th October*.—He took an equal dose in the same vehicle

as the first, with similar effects, but in greater proportion, and two evacuations of various colours and very fœtid.

19*th.* The same dose in the same form; the urine was much more abundant than on the two preceding days, and the patient reckoned that he had made water about thirty times; the sweat was also copious. This day he perceived some power of feeling in his skin, which he had lost for some years; he had also the same disagreeable sensation in the epigastrium as on the first day.

20*th.* He took nourishment alone, having risen languid and very weak.

21*st.* He took seventy-six grains of Cuichunchulli in the same vehicle as before, which gave him four large and very fœtid stools of unusual colours. The urine and the sweat continued also to be abundant; there was besides observed that a large tubercle situated over the musculi gemini, (or Ischio-Spini-Trochanterianus) of the left hip had disappeared, and that a large ulcer which occupied the lower and hinder part of the right leg, and the outer portion of the tarsus and metatarsus thereof, together with others that covered the fingers and a part of the hands, and which hitherto had borne a sordid inflammatory appearance with some points very putrid, presented this day a clean and benign surface, with signs of cicatrization at their edges. It is also to be noted that some issues which the patient had kept running for a long time, and which gave out a sanious pus in very small quantity, discharged this day a very large quantity of good pus.

22*d.* Ninety-two grains in wine were given. His colour became much less red than it had been; many of the tubercles on the face and ears disappeared, and various portions of dried skin fell off; the ulcers appeared cicatrized over more than the half of their surface, and the issues continued to yield good pus abundantly. He had besides eight large stools; the urine and sweat continued to increase, as well as the sensibility of his skin and the mobility of all his limbs.

23*d.* He took no medicine, but the secretion of urine and perspiration continued, though less copiously than the pre-

ceding days.—The mobility and sensibility of the limbs was more evident.

24*th.* He took a dose of forty grains as before. This day was a very abundant spitting; the urine and sweat greater than the day before, and the ulcers almost healed. He had besides two large stools.

25*th.* The same prescription with the same results.

26*th.* The same dose and the same effects, except that the spitting was less. The ulcers were fomented with a decoction of the residue of the remedy, after sifting the powder.

27*th.* None of the Cuichunchulli given. The urine was excessively abundant, and he had to pass it twenty-five times, in consequence of which he felt an acute pain about the pubis, which however went off without any medical aid or medicine. The ulcers were reduced, that of the leg to the diameter of a half dollar, while those of the hands were completely cicatrized. The issues went on suppurating copiously; the powers of moving the limbs, and of sensation in them augmented.

28*th.* The remedy was likewise suspended this day; the urine and sweat beyond the natural quantity.

29*th.* Two scruples of the plant were given. There was more of urine and of sweat than the preceding day, and there was again much spitting of saliva. The colour of the face has been during the last days gradually, yet sensibly restored to its natural hue.

30*th.* The plant was not administered this day, because the portion of it that had been spared to this individual was now consumed. The good effects that had been observed for several days past began to diminish; the saliva was in its natural quantity.

The said Puche continued as above until the 2d of November, when all his "natural" functions appeared to be in the same state as before the exhibition of the Cuichunchulli, but the sensibility and mobility acquired during its use were retained, without tubercles in the face or ears. The ulcer of the leg had diminished to the size of a peseta, (about the size of a shilling;) the joints of the fingers having some motion in

such of them as had not lost any of the phalanges by the progress of ulceration: the feet and legs are quite œdematous, and particularly that which is ulcerated. It is found also that some down and hair has been reproduced in certain places whence it had fallen off, and chiefly on the head. The issues suppurate a good deal.

After that period, he was attacked with acute opthalmia, and ulceration of one ear, but he was cured of these by the means usually prescribed in such affections; and at the present date he remains in the state above described.

DIARY OF THE EFFECTS OBSERVED IN CASANOVA.

The first dose of the Cuichunchulli, to the quantity of half a drachm, dissolved in water, was taken on the 10th of November. In the course of this day nothing unusual was felt, beyond some nausea after swallowing the medicine, and a sensible increase in the salivary secretion.

11*th November.* The same dose in the same vehicle; the secretion of saliva was much greater this day than yesterday, and it was of a yellow colour and fœtid. There were besides felt some spasms in the stomach.

12*th.* Forty-five grains were given; the secretion of saliva was moderate, and cramps were felt in the whole body.

13*th.* The dose of forty-five grains was repeated, and dissolved in wine and water; the quantity of saliva was much greater this day, accompanied by a distressing heartburn.

14*th.* The patient took a drachm of the plant in the same way, which caused some nausea; the flow of saliva was abundant, and that of urine so great that he passed urine seven times.

15*th.* The same dose as yesterday; the urine was passed six times this day, and the saliva greatly increased, with the colour and fœtor before mentioned.

16*th.* The dose was enlarged to a drachm and a half, diluted in two ounces of white wine; the urine was this day passed eight times, and there were three stools; the saliva continued as for some days past.

17*th.* The dose of yesterday was repeated; both urine and saliva were as before.

18*th.* Two drachms were given in wine; five large stools were produced, the urine was passed ten times, and the saliva as of late.

19*th.* The same dose as yesterday; and with the same results, except that the saliva was more fœtid.

20*th.* The same dose; the urine and the saliva as yesterday; but only one stool.

21*st.* The same dose, with effects similar to those of yesterday.

22*d.* The dose was increased to two drachms and a half in wine; the urine and the saliva went on exactly as yesterday; but the stools were five in number.

23*d.* The Cuichunchulli was suspended this day; the urine and saliva continued in the same increased proportion as latterly.

24*th.* The patient took two drachms and a half of the plant in wine; he made water twelve times and had five stools; the saliva as abundant as of late.

25*th.* He took no medicine; the urine was passed eight times; the saliva as yesterday, and nothing else that was particular was observed.

26*th.* Two drachms and a half of the plant were taken; he made water thrice, and had four stools; the saliva increased as before.

27th. No medicine was taken this day, nor was any thing unusual noticed.

28*th.* The same dose of two drachms and a half was given; he urined three times and had three stools; the saliva as abundant as before.

29*th.* The medicine was suspended; the urine was passed eight times; the saliva as of late.

30*th.* He took two drachms and a half divided into two equal portions, with an interval of half an hour between them, and in the same vehicle; the first of them caused much vomit-

ing, but the second was retained; he urined this day eleven times and had three stools; the saliva was very abundant.

1*st December.* No medicine taken; nothing particular; urine and saliva less than yesterday.

2*d.* The same dose of two and a half drachms given in two portions. The urine was passed sixteen times; he had three stools. The saliva was in less quantity.

3*d.* He rested. The urine and saliva in an increased proportion.

4*th.* Two drachms and fifteen grains were administered, which was all that remained of the Cuichunchulli; the effects and other circumstances were the same as on the preceding days.

From this time, the copious secretions of the organs above mentioned diminished gradually in quantity, till the patient returned to the state in which he had been at his commencing with this medicine; no other improvement of his diseased condition having been felt, than that the redness of the skin over the face was lessened around the eyes only, and that he perceived a slight degree of feeling and of perspiration over the skin of his left foot, which he had not had previously.

(Signed) M. DE AROCHE.

Maracaybo, 30th January, 1834.

From the preceding Diaries it will be seen that the remedy was discontinued in both the cases from the stock of it on hand having been all expended. It seems, however, that besides what Messrs. Casanova had spared to Puche, they generously forwarded a larger portion of it to Caracas for a young lady named Maria Antonia Macpherson, who was likewise affected with the Mal de San Lazaro, and who was there treated with it under the care of Dr. Don Carlos Arvelo. As her case has been published in an official report concerning the Cuichunchulli, which was presented to the Venezuelian Government by the College or "Facultad Medica" of Caracas, and printed in the Gazette of that city, of the 18th January, 1834, which is now before me, I think it right to cite this

also, as being immediately connected with the two foregoing cases, since the very same plant was unquestionably employed with each of the three patients, and as affording besides the experience of another disinterested practitioner in regard to its effects in that disease. The case is as follows:

"The Senorita Maria Antonia Macpherson, when eleven years old, and residing in the city of Maracaybo, was affected with a furfuraceous eruption over the lower extremities, which afterwards spread to other parts of the body. A medical practitioner having been consulted for this complaint, she was placed under treatment, which was continued with slight interruptions, for the space of four years. At the expiration of that time, as the disorder was advancing, and her parents were apprehensive that it might degenerate into some formidable affection, they determined to bring her to this city, (Caracas) where she arrived about the end of the year 1831. The young lady was then seen by several medical men, and by them it was with regret ascertained that she was already labouring under Elephantiasis, in a more than incipient state. Some recommendations, and above all, my desire to do all I could in behalf of this unfortunate young lady, and not any expectation of success in the attempts I might make, induced me to afford her my assistance, and to prescribe for her some of the most active and powerful medicines that are known. But all proved useless. The symptoms peculiar to Elephantiasis unfolding themselves, more and more established its character beyond all doubt. The colour of the face was of a darkish red, and the countenance dejected, the forehead was frowning, the eyes reddened, roundish, and having a harsh look, eyebrows destitute of hair, ears enlarged and elongated, the voice with a nasal sound, the breath fœtid, dark-coloured, grayish, and light brown patches on various portions of the skin, tubercles, and ulcers that had eroded the nails of the hands, loss of feeling in the skin, sudden faintnesses, general emaciation; such were the symptoms and condition which the patient presented in November last (1833,) a condition certainly well adapted for

testing the remedial power of whatever medicinal agent might be employed.

"It was in this state that she began to take the Cuichunchulli, which was given in the powder mixed with wine in doses of half a drachm, afterwards increased to two drachms; and she took in the whole ten drachms, which, though scanty, was all that could be obtained for a trial. The sensible effects were, a formication over various portions of the skin, but especially in the lower extremities, nausea more or less considerable and frequent, increased spitting like salivation, an open state of the pores, and even some perspiration, giddiness or vertigoes, a copious flow of turbid urine depositing a sediment, and whitish bilious evacuations. Of these several effects the ptyalism continued for many days after the medicine was expended. The result has been that the patient has experienced some marked alterations in her system, and a favourable change in the intensity of some of the symptoms. She has felt pains and tension in the hypogastrium, accompanied with a serous discharge tinged with blood, indicative as it were of menstruation, which had not yet appeared, although she is now 18 years old. She finds that her breasts, previously obliterated, are becoming painful and enlarging; her countenance is now cheerful, the colour of her skin lighter, the ears are reduced in size and no longer covered with scales; her voice is clear, the corroding ulcers on her fingers have healed, and her hands have acquired sufficient pliableness and sensibility to enable her to use her needle. Two small tumours which she says that she had on the right shin, *probably* in the periosteum, have disappeared. In short, she performs all her functions with cheerfulness, ease, and promptness, particularly when moving about."

Such are the cases related by Senor de Aroche and Dr. Arvelo; and although both their trials with the Cuichunchulli were cut short by insufficiency of the medicine supplied, they serve at least, if they may be relied upon, to attest its highly beneficial action in two of the three patients, Puche and Miss Macpherson. Yet, if these trials be compared with that of

the lay-jesuit, as related by Velasco, one would be led, from the very great difference in their respective course and results to conclude, either that the plant used in the last mentioned case was not the same with that forwarded by Col. Casanova to his relations in Maracaybo, or that the lay-jesuit's cure has been exaggerated. Of the identity of the plant in all the cases alluded to, nothing can now be determined; but we may at all events enter into some examination as to the fidelity of the Padre's statement.

It is clear, in the first place, that Velasco could have had but a slight knowledge of plants; else he would at once have perceived that the nerve-like filaments, which the Indian succeeded in making him believe to be the entire plant, were the roots only, and therefore "without any leaves." This was a deception doubtless resorted to for the purpose of preventing the Padre's discovering the plant itself; for it has been the constant practice of the Aborigines even to this day, as I am assured by Columbians of high authority, to enwrap in mystery and concealment every vegetable or other production of the country, which they believe to possess particular uses or virtues.

In the next place, will it be thought credible by any experienced physician that a single dose of only thirty grains of a vegetable powder, after vomiting and purging a Lazar violently, for a space of twenty-four hours, was able also, and immediately afterwards, to dry up and heal foul ulcers of years' standing, to remove every tubercular tumour on the surface of his body by causing the old skin to be cast off piecemeal, and to work the complete cure of so chronic a malady as that in question, in the course of "a few days?" In the third place, the Padre says that he was "an eye witness to all the occurrences just mentioned in Cuenca;" but it is plain that if the facts, as stated by him, be themselves very improbable, his assertion of having witnessed them will not be less questionable. When the firm persuasion, moreover, and the dread are considered, which have have long been universally entertained throughout Spanish America of the extreme

contagiousness of the Mal de San Lazaro, it does not appear likely that Velasco would have unnecessarily exposed himself to the danger of taking it by personally visiting and watching the lay-brother in so advanced a stage of that loathsome disorder during the progress of his treatment. I do not here, however, mean to accuse Padre Velasco of intentional exaggeration of the case; but I conceive the probability to be that, as he knew the lay-brother to have been suffering severely from that disease, as he had seen the medicine that was administered to him, and as he found him afterwards improved in health, he gave ready faith to the story which the Indian chose to tell him, who would naturally desire to make the cure appear a marvellous one; and under that belief, while afterwards recording the event with the praiseworthy intention of ultimately making the virtues of that plant known to the world, he may have thought himself justified in saying that he had witnessed "all" the circumstances he mentions.

It may notwithstanding be remarked that, if so extraordinary a cure as the above had really been effected, it could scarcely have passed unnoticed in Cuenca, a city that contained at that period, besides a college of Jesuits (in which the patient probably resided), four convents of friars, two nunneries, and about twenty-five thousand inhabitants. The Jesuits were then, 1754, in the plenitude of their power; and one can see no motive for their suppressing on that occasion all mention of so powerful a remedy, as in that case it ought to have been considered, but a thousand for their at once divulging it, which, from their extensive connections, they had ample means of doing.

I revert, however, to my narrative. It happened in November, 1833, that a French gentleman settled in Maracaybo, Monsieur Jean Batiste Marcucci, who had been acquainted with Jacopo Puche's diseased state for some years, from having frequent occasion to pass his door, heard of his amendment, and was thereby prompted to visit him. Surprised at the great improvement he perceived in the Lazar's condition, and not knowing, as it appears, that Senor Casanova was then

under a similar treatment, he at once made up his mind to set out in search of the plant that had wrought so much good in him, in the hope, as well of procuring a relief for mankind against so horrid a disorder, as of deriving some personal advantage for the support of his large family. As no vessel then offered for Jamaica, he had, in January, 1834, to go coastwise to Sasarida in Coro, to Rio Hache, and to Aruba, in order to reach this island, whence he soon proceeded to Chagre and Panama. There, after a long detention, and in despair of a direct opportunity for Guayaquil, he was forced to embark in small coasting vessels, going occasionally in directions very different from his own, being almost always exposed to great privations, to personal hardships, and frequently to the various perils that attend this sort of navigation; and when at length he succeeded in reaching the coast of the State of the Equator, he found a great part of that country disturbed or desolated by a far-spread civil war, so that in every attempt he made to penetrate into the interior, he was sooner or later supposed by one or other of the hostile parties to be a spy, and generally compelled to retrace his steps, and encounter fresh difficulties or dangers at sea or on shore. In the end, unable to overcome obstacles that met him at every step in that distracted country, he resolved to make a wide circuit by the way of Peru, and finding an American whaler at Tumbes bound to Payta, he went on board; and, on his landing there, he proceeded to Piura, going for several days over heated sands; and thence, crossing the province of Loxa, he was able to enter the state of the Equator by roads almost impassable, over mountains of astonishing elevation and extremely cold temperatures, living for a month on the food of savages, and stopping in Indian huts, swarming with vermin, from which no precautions can preserve one. Thus harassed, and much bruised withal by the falling of his horse while descending a path unusually steep, on sliding ground, he arrived at Cuenca, where his first care was to inform himself as to the Cuichunchulli. Indians were presently brought to him, who assured him that they knew the plant perfectly well, and offered to get it for him,

and who soon returned with a plant that had a straight stem, twelve or fifteen inches high, bearing a few leaves and furnished with short, tender, thread-like radicles, and that grew in a rich and well watered soil. At the sight of this herb, so entirely different in appearance from that described by Velasco, as well as from that which Puche had shown him, he felt quite disconcerted. Nevertheless he dried the plant in the shade, and then had the roots and leaves reduced to powder that he might try it on himself. He accordingly took the same dose that Puche began with; but, as it produced no effect, he next took a dose of the powdered roots only, and this had no more effect than the former. Being now convinced that this herb was inert, not only by his own trials, but by those which he was informed that several persons had made in vain, in whom the Mal de San Lazaro had made great progress, and giving up all hope of obtaining the true plant through the agency of any of the Indians in that quarter, whose good faith he then suspected, he went to explore in person the mountains around Cuenca, and examined with great attention the most retired and least accessible spots of the deserts of Pasul, Izincocha, Mibir, and Soldados, where the wanderer is forced to stop and admire the strange and sublime effects of nature that he finds at every step; but, after eight days of fatiguing excursions, having met with no plant which bore the slightest resemblance to that he was seeking, he returned to Cuenca, taking a different direction from his former one, over a mountain of extraordinary height and abounding in grand and romantic scenery, but in deep affliction at the total failure of his enterprise. So much of enthusiastic zeal and perseverance, however, were not left wholly unrewarded; for in about a week after that fruitless expedition, he had the satisfaction of learning that the Post-Master-General of the district, who resided in Cuenca, had recently given a medicine called Cuichunchulli with great benefit to a son and daughter of his who had been suffering severely from leprosy for five or six years. Upon this he immediately waited upon that gentleman, and received from him the following detail of

the former state of his children, and of the results that had been effected in each of them by that remedy:

"I have two children, one a son 22 years of age, the other a daughter, 23. Both in their childhood enjoyed perfect health, but, before they reached the age of puberty, they were each most unfortunately seized with the lazarine malady. The disorder attacked the boy with more violence; for, in addition to dark coloured patches, enlargement of the ears, disfiguration of the features, eyebrows prominent and destitute of hair, nasal tone of the voice, and loss of the sense of touch, that were observed in them both, the lad had entirely lost the use of his legs, which were swelled to a monstrous degree, and covered with ulceration; and the fingers of his hands became contracted. In short, he was in so crippled a state that he could not stir a step by himself, and required the help of two servants to support him to walk about the house. The girl was not so grievously affected; but her menstruation was suppressed. When they had continued for a long time in this deplorable condition, and had taken a thousand drugs without any benefit, the account that had been published concerning the Cuichunchulli came to my knowledge, and I immediately administered to them the plant that grows here according to the directions therein given; the dose was afterwards tripled, but to no sort of purpose. Being then convinced that the plant of this neighbourhood was quite ineffective, I sent to request some of that of Canar, a town the climate of which is cold; but neither from this was any good effect obtained. During that period of trials that proved fruitless I received a letter from a friend to whom I had forwarded some of the Cuichunchulli of this place, in which he informed me that the plant I had sent to him did not possess the properties which had been attributed to it, and that he had reason to believe that the plant that was sent to Maracaybo must have come from the Province of Chimborazo. In consequence of this intimation, I wrote to another friend in Riobamba, begging him to send me some of the Cuichunchulli growing there. He sent it accordingly, and I at once gave it to my children, with

the happiest effect that could be desired. The action of the first dose, which was a drachm, (dos adarmes, i. e. two half drachms,) was extraordinary, operating copiously in both ways, and causing in each great perspiration and much languor. The girl vomited much more than the boy. They went on taking the remedy, in increased doses, and the result has been that both are remarkably better, but the boy particularly, who before could not feel a burning coal put close to his hand, but he now feels the bites of fleas; the swelling of his legs has gone down, the ulcers on them have healed, the fingers have become flexible, the dark patches on the skin and the enlargement of the features have disappeared, the pronunciation is clear, and he has so much recovered the use of his limbs that he saddles and mounts his horse by himself. In the girl, the marks of the disease have not yet wholly disappeared; she is, however, much improved, and menstruation has made its appearance, which gives me hope that her cure will be effected." With respect to these two cases, M. Marcucci adds "that not willing to rely altogether on the account he had received from Senor Borrero, he went to see his children, and was satisfied that they had both received very considerable advantage, although traces still remained in their countenances of the frightful malady with which they had been stricken."

Possessed of the above highly important information, Monsieur Marcucci made immediate preparation for proceeding to Riobamba, but the revolution that had already invaded the province of Chimborazo, and was advancing into that of Asuay, detained him in Cuenca a fortnight longer. The roads being at length free, he left that city, and passing over chains of mountains covered with eternal snow, wading at times through mire, crossing dark and dismal deserts, and climbing almost inaccessible heights, surmounted with others which one gets over only at the risk of breaking his neck, after eight days of unceasing exertions he reached Riobamba, a small town at the foot of the great Chimborazo. During this journey from Cuenca he had to stop at the small town of Canar, where he

made inquiries if they had the Cuichunchulli; and this being told to a white woman of the place, she supposed him to be a physician, and sent to request that he would see her, which he complied with. This unfortunate person, about 25 years of age, had all the signs of the Mal de San Lazaro, in a marked degree, and was besides in extreme indigence. She told him that it was four years since she was attacked with the disorder, and that, having lately heard of the virtues of the plant just mentioned, she had taken some of it that grew about that village; but that it had done her no good whatever; and that she afterwards procured the Chimborazo plant, though with the greatest difficulty, and had taken it in doses of two drachms, steeped in water for the space of ten days, at the end of which her supply of it was expended, and her poverty disabled her from obtaining any more, and even from getting proper nourishment. The medicine, she said, both vomited and purged her, and brought on excessive sweatings, a great flow of urine, and much faintness, but her ears and hands became less swelled, and more sensible, and the ulcers she had on different parts of the body were generally reduced to one-third of their previous size. She gave him a remnant of the plant from Chimborazo, with its leaves, &c., and these he found were exactly similar to those from Riobamba which had been shown to him by Senor Borrero in Cuenca.

When in Riobamba, Monsieur Marcucci received all necessary information concerning the plant he was seeking from the parties who had procured it for Senor Borrero, and by means of Indians whom they recommended, he collected some quantity of it, although, as it is not very abundant, he thought that quantity but trifling when compared with the expenses, the troubles, and the hazards he had incurred for its acquisition. He believes, indeed, that he might have collected more, if he had continued longer at Riobamba; but he was frequently indisposed during the thirty days he passed in that town, particularly from severe attacks of intermittent fever, and therefore was obliged to leave it for Guayaquil, where he embarked

first for Payta, then for Panama, and afterwards came here in his Majesty's brig Savage. Very shortly afterwards he did me the favour to place in my hands a portion of the Cuichunchulli he had brought with him, which he requested I would employ in cases of the Mal de San Lazaro, in order to ascertain its medicinal powers; and he likewise, at my desire, sent me an account of his voyage, from which I have extracted the foregoing particulars.

Mr. Marcucci being anxious that my trials of this plant should be made with the least delay possible, as his stay in Jamaica would be limited, I commenced by administering it to five of the most diseased Lazars, (negroes or samboes, one man and four women) that I found in the Cocobay Asylum, (a small building attached to the Kingston House of Correction,) whom I was kindly permitted by the officers of the institution to take under temporary charge; and I afterwards gave it to two others, a mulatto woman, and a white man. It is necessary to premise that the quantity of the dried plant which I received, when reduced to powder, did not exceed eleven or twelve ounces; that, to make it go farther, I had the stems and leaves ground up with the roots, (although I have since thought it very possible that the medicinal properties of the plant may reside in its roots alone,) and that, in consequence of Mr. Marcucci's being afterwards under the necessity of embarking for Maracaybo sooner than I had expected, (when he took with him the remainder of his Cuichunchulli,) my trials with it were necessarily put a stop to, long before they could fairly be deemed to have had sufficient time to produce their full results.

When the first six of the above mentioned patients had taken about ten drachms each of the powder, which was the whole that I could spare to them, and which was given in doses of thirty grains raised gradually to sixty, they generally stated that their condition was bettered in various respects, and particularly that the heat and tension they commonly felt over the body, mostly during the night, was considerably diminished, and was succeeded by a comparative

feeling of general ease and comfort; that their limbs were lighter and more flexible, and that the sense of touch, and the use of their hands and feet, were partially restored, so that some of them could handle a knife or a fork, work with a needle, or walk tolerably fast, which they were more or less unable to do before; most of them besides thought that their tubercular swellings were somewhat lessened, but such a reduction was to my eyes scarcely apparent. The natural secretions and excretions were sometimes moderately increased after taking the powder, but no one among them complained to me of very copious vomitings, purging, or secretions of urine or of saliva, neither did I witness the prompt curative effects which Messrs. Arvelo and Aroche observed in Miss Macpherson and in Puche. On the contrary the progress of the patients here has been comparatively slow, and their cure has, in truth, scarcely begun; but it has been to me no slight satisfaction to find that, in one of the most obstinate and loathsome of maladies, any sensible amendment, such as that acknowledged by the six patients now under consideration, could be brought about in the course of the five or six weeks only during which they were treated with the Cuichunchulli. It is right also to mention, first, that in all these cases I abstained from employing any of those other medicines, from which my previous experience in the treatment of that disease would have led me to expect useful aid; and secondly, that, as patients, the Lazars in the asylum laboured under serious disadvantages, because their food was only that allowed to the people confined for misconduct in the House of Correction; besides which most of them were very insufficiently clothed; but I made no objection to the patients on either of these scores, my object being to put the remedial powers of the Cuichunchulli to the clearest, though it might be the severest, test, which I was induced to do by the uncommon, and, I now believe, over-rated virtues ascribed to it by Padre Velasco. Had my trials been restricted to less advanced cases of the disorder, they would perhaps have been more successful. But, although no doubt exists in my mind that the Lazars in the

asylum received some benefit from that remedy, I must at the same time state my opinion that the account they gave of their own improvement ought not to be relied upon implicitly. I allowed them almost always to tell their own story, without putting leading questions to them, and I uniformly desired them to say nothing but the truth, and to inform me with equal readiness of the harm as of the good which they might think the medicine had done them; yet they seldom or never acknowledged any harm from it. It was doubtless a great consolation to these people to find themselves visited in their wretched and forlorn situation by a stranger, who was endeavouring to alleviate their bodily sufferings by administering to them what he hoped might prove a remedy; and this was likely to excite a desire on their part to afford him in their answers every satisfaction they could, so as to induce him to prolong his attendance on themselves, while a denial of any good effect from the medicine might, in their apprehensions, lead to the discontinuance of his visits, and to their being again as it were abandoned to their unhappy fate. But these observations do not apply to the mulatto female Lazar, since she was under no similar privations; and I regard her statements as sincere and worthy of credit. One of the effects she experienced it may be worth while to notice here. When she had taken about six drachms of the powder, I found that three small ulcers on her left hand had healed; and she said that she had more of feeling and motion, both in her hands and the joints than before; but she also said that, prior to my seeing her, she "used to feel great heat all over the skin, and mostly on the face and hands," which generally increased in the evening, and continued to such a degree through the night as to make her very restless, and to deprive her almost entirely of sleep, and that the only means by which she could abate that heat and get any rest was by bathing in cold water; but that now she had "much less heat over her, and was no longer obliged to bathe at night, but could lie down and get to sleep at once, and enjoy a sleep nearly natural." Soon after this, she was hindered for eight or ten days from taking the pow-

ders, and ere long the nightly heats recurred; but they again subsided after taking a few more powders.

The case of my white patient is next to be mentioned. As I had entire confidence in his punctuality as to taking the medicine, in his intelligence, veracity, and, I may add, moral worth, I felt great interest in his behalf, and therefore I gave him the remainder of the powder I had, about five ounces. He persevered in its use until he had taken the whole for about two months, during which he strictly conformed to whatever directions I judged requisite. But it is with pain I state that at the expiration of that term neither the patient nor myself could perceive that the Cuichunchulli had been of the least service to him. Sometimes indeed he told me that he thought himself rather better, but that farther reflection presently did away with the illusion. In this case therefore the plant in question has completely failed; but this failure may only serve to confirm the general rule, that no medicine is equally effective in all cases.

Having now submitted all the authenticated testimonies concerning the medicinal action of the Cuichunchulli that have come into my possession, together with my own experience of it, some notice of the plant itself seems requisite. Velasco, it will be recollected, spoke of it as "a small whitish slender nerve that issued from beneath stones to which it adhered firmly;" but from so obscure a description it would obviously be next to impossible to find out the plant. Besides this obstacle to its discovery, another serious one has arisen from the circumstance he stated, that the trial made with it by an Indian on the lay-jesuit took place in Cuenca. This naturally induces the belief that the plant he then used was a native of that city; and as there is an herb growing in that neighbourhood, which is known to the Indians by the name of Cuichunchulli, it is no wonder that various persons under that impression should, as we have already seen, have made trial of the Cuenca plant, although we are informed that, from its being wholly inert, they have all been miserably disappointed in its effects. For this reason, however, and also because the roots

of this plant, which have been above described, are very unlike those mentioned by Velasco, it is quite evident that it was not the Cuenca plant, but a different vegetable that was given by the Indian to the lay-jesuit, and Monsieur Marcucci is of opinion that the Indian's plant was in all probability procured, as we know that Senor Borrero's had been, from the skirts of the great Chimborazo, which are considerably less distant by going along the bye-paths known to the aborigines, than by the common road. Of the Cuenca plant, inert as it is, I am glad to say that, through the aid of my friend, Don Alejo de Ybarra y Sorzano, I have likewise received specimens taken from a quantity sent hither from Guayaquil (to be forwarded to a gentleman in Columbia, who had written for the Cuichunchulli,) under the supposition of its being the true or medicinal plant; and as these specimens had leaves, flowers, &c. it has been in my power to ascertain their botanical character, which I think it advisable to mention here, for the chance of its being copied into other publications, and of its thus becoming sufficiently known to prevent the recurrence of mistakes so distressing as happened in the instances of Senor Borrero's children, and of the other individuals to whom allusion has already been made. The Cuenca plant belongs to the Linnæan class and order of Didynamia gymnospermia, and to the natural order Labiatæ; but it does not correspond in its characters with any of the genera which I find described by authors under those heads, and it consequently seems to form a new genus, whose distinguishing characters may be thus defined, *viz.:*

Calyx campanulate, many-striate, five-toothed, teeth equal, mucronate; corolla, upper lip quadrified, lower rounded concave.

In addition to the Cuichunchulli of Cuenca, and to that brought from Riobamba by Monsieur Marcucci, which will be presently adverted to, I learn that a third plant bearing the same name has been mentioned as growing at Puracé, in the Canton of Popayan, and that this, having been examined by Professor Don Juan Maria Cespedes, proved to be the same

with a plant called Featina, that is found in the neighbourhood of Bogota and at Enemocan, and was formerly described by the celebrated botanist Don Francisco Mutis, under the name of Viola Parviflora, a title that has since been judiciously changed by another distinguished botanist, Monsieur Ventenat, into that of Ionidium Parviflorum. This latter plant is said to have been also used with advantage in the Mal de San Lazaro; but as the account of that trial appears not to have been written by a medical man, and has not even been authenticated by any signature, it cannot at present claim attention. I have, notwithstanding, been induced to compare the botanical characters of this plant with those of the Cuichunchulli of Riobamba, and as I find that, although of the same genus, they belong to different species, I shall subjoin their respective specific differences in order to prevent their being mistaken the one for the other.

The Cuichunchulli of Riobamba is a small humble plant, generally growing flat on the ground both in cold and in moderately warm temperatures on the sides of Chimborazo, and always in a dry and rocky soil, its roots so insinuating themselves between the stones that it is necessary to loosen these with a spade or other instrument in order to draw them out entire. It bears plenty of leaves, which seldom exceed five-eighths of an inch in length, and also of flowers one-eighth of an inch at most in height, delicate in structure, the petals of which are of a violet or purplish colour with the exception of the labellum, which is rose-coloured at the back, but white on the inner surface. The capsules are yellowish, one-tenth of an inch in diameter, and the seeds dark brown and shining. Cattle sometimes browse on the plant, but only for the purpose, as the Indians believe, of purging themselves, since it does not grow in sufficient quantity to serve them as a pasturage. The natives of the country use it among themselves as a very active medicine that vomits and purges at the same time.

Upon obtaining from Mr. Marcucci dried samples of the plant just mentioned, which I had reason to think was yet

botanically unknown, I examined it carefully, and found that it belonged to the Linnæan class and order, Pentandria Monogynia, to the natural order Violarieæ, and tribe Violeæ, of Decandolle, and to the genus Ionidium of Ventenat; but, after comparing its botanical characters with those of the several species of this genus that are described by the numerous modern authors, to whose works I have had access, and more particularly to the excellent Prodromus systematis naturalis Regni Vegetabilis, by Decandolle, I could not discover any species among them to which the plant from Riobamba could with propriety be referred, though it most nearly resembled Ionidium parviflorum. It appears therefore, to be a new species; and as it has been the practice with botanists to permit those, who make known the characters of genera or species that have not previously been described, to bestow on their plants such names as they may consider appropriate, I hope that the same favour may be extended to me in regard to the Cuichunchulli; and in this case I would propose that its specific designation should be Ionidium Marcucci, as a compliment due to Monsieur Marcucci, for the zeal and patience with which he encountered innumerable hardships and dangers in its search, and, when he had succeeded in obtaining it, for his philanthropic endeavours, through my means, to have its reputed medicinal properties ascertained, and to give the fullest publicity to its localities and peculiar characters, so that all hereafter, who might want it, should know where to procure it, and how with certainty to recognise it. The following are its botanical characters:

Ionidium Marcucci (*nobis.*)

Calyx quinque-partitus, basi in pedunculum decurrens, persistens; sepalis ovatis, acutis, glabris, margine membranaceis, duobus inferioribus reliqua paulo superantibus.

Ionidium Marcucci.

Calyx five-parted, running et base into the peduncle, persistent; the sepals ovate, acute, smooth, membranaceous at the margin, the two inferior (as they are termed by Ventenat and Decandolle,) longer than the rest.

Coralla pentapetala, bilabiata hypogyna, petalis thalamo insertis, inæqualibus, marcescentibus; labio inferiore monopetalo, calyce duplo triplove longiore, superne in laminam transversam vel labellum late obcordatum dilatato, medio angustato, carinato, basi paulo gibbo; labio superiore tetrapetalo, calycem superante, lateralibus antrorsum falcatis, mediis minoribus apice reflexis.

Corolla five-petaled, two lipped, hypogynous; petals inserted on the thalamus, unequal, withering; the lower lip one-petaled, twice or thrice longer than the calyx, dilated at its upper portion into a transverse lamina or broadly obcordate labellum, narrowed and keeled at the middle, and slightly gibbous at base; upper lip four-petaled, higher than the calyx, lateral petals falcated forwards, middle ones shorter with their tips reflected.

Stamina quinque, thalamo inserta, libera, approximata, filamentis, brevibus dilatatis, ovario adpressis, antheras ad basin gerentibus, apice ultra antheras in membranam ovatam stylum cingentem productis; antheris bilocularibus, introrsum rima longitudinali dehiscentibus; squamulis glandulisve nectareis nullis.

Stamens five, inserted on the thalamus, free, approximating; filaments short, dilated, adpressed to the ovary, bearing the anthers near the base, produced beyond the anthers into an ovate membrane surrounding the style; anthers two-lobed, opening on the inside by a longitudinal cleft, and without any nectareal scales or glands.

Ovarium superum, sessile, uniloculare, hexaspermum, placentis tribus parietalibus sepalis exterioribus oppositis, stylus I, persistens, apice recurvo; stigma obtusum, laterale, labellum spectans.

Ovary superior, sessile, one-celled, six-seeded, with three parietal placentæ opposite to the outer sepals; style one, persistent, bent downwards at its tip; stigma obtuse; turned sideways towards the labellum.

Capsula sphærico-trigona, trivalvis, unilocularis, sutura loculicida; valvis ab apice ad basin dehiscentibus, medio seminiferis, dispermis, sæpius abortu monospermis; seminibus globoso-ovatis, apice concavo-truncatis, nitidis, fuscis.

Capsule sphærico-trigonal, three-valved, one-celled, with a loculicidous suture; valves opening from tip to base, bearing two seeds in the middle, but more frequently, from abortion, one seed; seeds globose-ovate, concavely truncated at apex, shining, dark brown.

Pedunculi axillares, solitarii, uniflori, folio longiores, graciles hinc linea puberula notati, supra medium articulati, nec bracteolati.

Peduncles axillary, solitary, one-flowered, longer than the leaf, slender, with a line of pubescence on one side, joined above the middle, without bracteæ.

Radices lignosæ, teretes, subhorizontales, tortuosæ, ramosæ, ramis vermicularibus, sæpe fasciculatis.

Caulis suffruticosus, procumbens, teres, tubulosus, ramosus; ramulis bifariam pubescentibus.

Folia alterna, ovalia, basi cuneata, utrinque rugosa? sub-ciliata, serrata, dentibus apice glandulosis; petiolis brevibus; stipulis petiolo sublongioribus, ovato-lanceolatis.

Roots woody, round, subhorizontal, tortuous, branched; branches vermiculor, often in tufts.

Stem undershrubby, procumbent, round, tubular, branches branched pubescent on two opposite sides.

Leaves alternate, oval, wedge-shaped at base, wrinkled on both sides? subciliated, serrated, apex of the teeth glandular; petioles short; stipules rather longer than the petioles, ovate-lanceolate.

Character Specificus.

Ionidium Marcucci, (nobis) suffruticosum, procumbens, ramosum, ramis bifariam pubescentibus, foliis alternis, ovalibus, basi cuneatis, serratis, dentibus apice glandulosis, stipulis petiola sublongioribus, ovato-lanceolatis, sepalis ovato-acutis, labello calycem duplo triplove superante, late obcordato, petalis lateralibus falcatis, filamentorum membranis terminalibus ovatis, pedunculis hinc linea puberula notatis, folio longioribus, capsula sphærico-trigona, seminibus globoso-ovatis, apice concavo truncatis nitidis fuscis. Habitat inter saxs prope Riobamba et Hambato Quitensium, ad pedem Volcani Chimborazo.

Specific Character.

Ionidium Marcucci, undershrubby, procumbent, branchy, branches pubescent on two opposite sides, leaves alternate, oval, wedge-shaped at base, serrated, the teeth glandular at the apex, stipules longer than the petioles, ovate-lanceolate, sepals ovate-acute, labellum twice or thrice longer than the calyx, obcordate, lateral petals falcated, terminal membranes of the filaments ovate, peduncles with a line of pubescence on one side, longer than the leaves. Capsules sphærico-trigonal, seeds globose, ovate, concavely truncated at the apex, shining, dark brown. Growing among the rocks about Riobamba and Hambato, at the foot of the great Volcano Chimborazo.

Differt Ionidium Marcucci (nobis) ab Ionidio parviflora (ventenat) Viola parviflora (Mutis et Linnæi.)

Caule suffruticoso, procumbente, tubuloso, foliis ovalibus, foliorum dentibus apice glandulosis, stipulis

Differt Ionidium parviflorum (ventenat) Viola parvifloro (Mutis et Linnæi) ab Ionidio Marcucci (nobis.)

Caule fruticoso, diffuso, foliis ovatis, stipulis petioli vix longitudine, pedunculis glabris, labello ovato,

petiolo sublongioribus, pedunculis hinc linea puberula notatis, labello late obcordato, squamulis nectareis nullis.

bilobo, squamulis nectareis subclavatis.

Specific differences of Ionidium Marcucci, as compared with Ionidium Parviflorum.

Stem undershrubby, procumbent, tubulous, leaves ovate, with the apex of their teeth glandular, stipules rather longer than the petioles, peduncles pubescent on one side, labellum broadly obcordate, no nectareous scales.

Specific differences of Ionidium Parviflorum, as compared with Ionidium Marcucci.

Stem shrubby, diffuse, leaves ovate, stipules rather shorter than the petioles, peduncles smooth, labellum ovate, two-lobed, nectareous scales subclavate.

Jamaica Phys. Journ.

ART. XXII.—ON THE PURIFICATION OF BEET JUICE, AND A METHOD OF PREPARING IT IN THE BEST MANNER.

By M. Pelletan.

Having for the last two years paid much attention to the subject of beet sugar, and the best methods of making it, I have become acquainted with the most scientific manufacturers, and have visited many of their establishments, and more especially that at Boistrancourt, under the direction of M. J. Castelyen.

I soon perceived, in a practical study of this new branch of industry, that the great difficulties were in the clarification of the juice and in the boiling. The first of these is accomplished by the addition of slacked lime, which is mixed with the juice just before it comes to the boiling point, and continuing the heat till ebullition commences. By this a scum is produced, which rises to the surface, whilst at the same time a precipitate is formed, leaving the intermediate fluid more or less clear and coloured. It is judged that the clarification is successful, 1st, when the scum is consistent; 2d, when the precipitate

takes place immediately, leaving the liquid clear; 3d, when this liquid is but slightly coloured.

Unfortunately, however, the dose of lime required is very variable, according to the season, the nature of the soil in which the roots have grown, the mode in which these roots have been kept, and finally, according to the time which has elapsed since they were gathered; it therefore varies from half a pound to three pounds to the hectolitre (22 gallons) of juice.

The sedulous attention of the manufacturer may obviate this inconvenience, in part, but even the greatest care is sometimes ineffectual, because, first, the clarification may take place where a sufficient quantity of lime has not been used; second, from the same result occurring with an excess of this agent; in either case much embarrassment in the subsequent processes will ensue.

If the lime has not been used in sufficient quantity, the juice, although but little coloured at first, will become very dark when evaporated, and the syrup will acquire great viscidity; if, on the contrary, an excess of lime has been employed, the juice will be light coloured and the syrup of a bright yellow, but on concentration, they will become burnt if the operation be performed by a naked fire, and will be deteriorated if evaporated by steam.

The causes of these two accidents have already been explained by several manufacturers and chemists; it has been shown that beet juice contains a mucilaginous matter, which is acted on very rapidly by the air; this is capable of combining with the lime and forming a precipitate; if a certain proportion of this remains in the juice, the syrup will be dark coloured as well as viscid. On the other hand, if an excess of lime be used, this excess will combine with the sugar and form a saccharate of lime; a compound which is very soluble, uncrystallizable, and retaining so much water as almost to prevent any concentration of the syrup.

Manufacturers have hitherto resorted to but one expedient to obviate these drawbacks; this consists in the use of animal charcoal. This substance, in fact, possesses not only the

property of decolourizing the syrup, but also of absorbing and retaining both the mucilage and the excess of lime. It would therefore appear, that it is merely necessary to filter the juice and syrups through a sufficient quantity of animal charcoal, to obtain the desired result.

But animal charcoal is dear, and will become more so as the demand for it increases; added to which, the quantity required is very great. I have seen pound for pound of it used, and even this prove insufficient, entailing an expense of 60,000 francs ($12,000) in the manufacture of 500,000 pounds of sugar, and perhaps it should have been doubled to have ensured the best results.

Manufacturers have therefore endeavoured to discover other means of removing the excess of lime, and it has been shown that this can be effected by means of an acid. Hence, in several establishments, alum and diluted sulphuric acid have been used; the solution of alum or the dilute acid being added to the syrup the moment it displays an excess of lime.

These methods, however, are attended with serious inconveniences; the sugar produced where an acid has been used being of a reddish colour, and having a burnt smell.

Other chemists have proposed to saturate the excess of lime with carbonic acid, but at the same time admit the difficulty of doing so. I had myself thought of this plan, and made arrangements for executing it in my apparatus for boiling the syrup in vacuo, but on a mature consideration of the difficulties attendant on it, abandoned it as useless.

I have found that to prevent the beet syrup from becoming red on concentration, there must be an excess of alkali, and also on the contrary that if this excess be too great, that the syrup will be ropy, and give a yellow and small grained sugar.

The hot air apparatus of M. Brame accidentally produces the complete saturation of the alkali contained in the clarified juice; in fact, the small proportion of carbonic acid forming a constituent of the vast body of air which in this apparatus passes through the juice, is sufficient to precipitate the whole of the lime, and on this account, the sugar produced is of a

reddish colour and has a burnt smell, and hence commands an inferior price.

It appeared to me that the presence of a certain quantity of alkali in the syrup preserves the sugar from acquiring a burnt smell, and this is confirmed by several facts. It should also be borne in mind that sugar which becomes dark coloured from the absence of an alkali, is with great difficulty whitened by means of animal charcoal.

Since, therefore, it is shown that the syrup must possess a certain degree of alkalinity to afford a good product, it remains to point out a simple but effectual mode, by which manufacturers may also keep their syrups in this state. This may be done as follows. Being provided with—

1. An alkalimeter, consisting of a tube graduated from 0° to 100°;

2. Alkalimetric liquor reduced to $\frac{1}{10}$, made by mixing one part of concentrated sulphuric acid of commerce with one hundred parts of water;

3. A graduated vessel to estimate the syrup;

4. A large vessel, in which the experiments are to be made;

5. Litmus paper, slightly reddened by an acid;

The trial is to be made in the following manner: When the syrup marks 10° of the syrupmeter (*pese sirop*,) a certain quantity is measured by means of the graduated measure; this is to be poured into the large vessel. On the other hand the alkalimeter is to be filled with the alkalimetric or test liquid, to 0° of the scale. This is then to be gradually added to the syrup, stirring well after each addition, and the test paper constantly used; as soon as this is restored to its blue colour, the addition of the diluted acid is to cease. The quantity of the test liquid required to produce this, is to be carefully noted, and the syrup then heated to observe whether the desired result is obtained; in general it will be found that the syrup requires 50° of the alkalimeter to bring it to a proper degree of alkalinity.

This operation, although apparently troublesome, is readily performed with a little experience, in a few minutes. When a manufacturer has ascertained the alkalimetric degree at which

his syrup evaporates the best, he should prepare the dilute sulphuric acid; this is done by mixing one part of the acid of commerce with twenty parts of water. He may now employ as much lime in clarification as he deems expedient. After evaporating the syrup until it marks 10°, a trial is to be made of it. If it marks more on the alkalimeter, than that ascertained to be the most advantageous, the dilute sulphuric acid is to be added by degrees, so as to reduce the syrup to the proper point.

With a little experience the manufacturer will readily ascertain the quantity of acid sufficient to saturate a given weight of lime; thus he will find that about a quart of the dilute acid will correspond to about a quarter of a pound of lime; so that when he is obliged to use an excess of this latter, he will at once be aware what additional quantity of acid will be required to saturate it.

An acquaintance with this fact, however, does not preclude the necessity of a preliminary trial of the alkalinity of the syrup, as this is liable to many changes; hence we have not been able to give any precise scale of degrees applicable to this syrup, nor attempted to decide in a positive manner with regard to the quantity of acid to be employed to a given weight of lime, as these must depend on the nature of the roots, the season of the year, the time the roots have been kept, &c., as well as on the purity of the lime.

But although we cannot give these data, we are happy in pointing out to the manufacturer a ready method of ascertaining the best proportions of alkali and acid required, and thus enabling him to obtain certain and invariable results.

I will cite an example in point. After having ascertained the truth of the above mentioned facts by a series of careful experiments, I had occasion to visit a well known manufactory; on entering it, I was immediately convinced, from the smell, that the syrup then boiling was not sufficiently alkaline, and was told that the sugar obtained was red and could not be bleached. On examining the process, I found that a pound of lime was used to each hectolitre of juice, that the clarification was apparently perfect, but that the syrup on eva-

poration became as red as blood. I advised that the proportion of lime should be increased; this was gradually done till it amounted to three pounds to the hectolitre of juice; the syrup and sugar now assumed a light yellow colour, but it was requisite to employ the acid to prevent their becoming ropy.

I am aware that there exists a general dislike to the sugars hitherto prepared with acid, and which may be always recognised by their colour and smell, and will make a few remarks on the subject.

It has almost always happened, that the manufacturers who endeavoured to obviate the excess of lime by the addition of sulphuric acid, have produced a red product; this has arisen from the following causes: first, the acid is oftentimes added at random, and though the most careful workmen employ it cautiously, and resort to the test paper to avoid an excess, thinking that this is the great evil to be guarded against, they are equally in error; for it is only when the sugar is too acid that it becomes red—this happens also when it is not sufficiently alkaline; so that the test paper is not a sure guide for estimating the proper quantity of acid to be used, there being in fact in most cases too much when the paper is restored to its blue colour, and consequently the liquor still alkaline; hence the syrup is not red from being too acid, but not sufficiently alkaline; in fact, the alkalimeter affords the only sure criterion of the proportion of acid to be employed.

There is another question which I have not been as yet able to solve; this is to ascertain if all the alkali in excess in the syrup is lime. As beet juice contains potash and ammonia, and as these alkalies may remain in a free state in the liquid after clarification, and even after the addition of a certain portion of sulphuric acid, which combines with the lime in preference, it may be that the excess of alkalinity is in part owing to these alkalies.* *Journ. de Con. Usuelles.*

* We have inserted the foregoing memoir, although it does not strictly comport with the plan of our Journal, but as the public attention is at this moment directed to the subject of Beet sugar, we have thought that these practical details would prove interesting to many of our readers. Ed.

ART. XXIII.—ON THE EVOLUTION OF LIGHT DURING CRYSTALLIZATION. By Henry Rose.*

An emission of light has often been noticed during crystallization, but its appearance has always been a casual one, and never, as far as I am aware of, has it been produced at will. I have observed, during the crystallization of arsenious acid, a strong emission of light, which differs from that seen during the crystallization of other substances, inasmuch as it may be produced at pleasure. Take two or three drachms of the transparent or vitreous arsenious acid, put it in a mattress of white glass along with an ounce and a half of not fuming muriatic acid of the common strength, and half an ounce of water; allow the whole to boil for ten minutes or a quarter of an hour, and then let it cool as slowly as possible, which is best done by gradually decreasing the flame of the spirit lamp which had been used for the boiling. If the experiment is conducted in a dark room, the crystallization is accompanied by a strong emission of light, the formation of each little crystal being attended by a spark. If the vessel is then agitated, a great number of crystals suddenly shoot up, and an equal number of sparks occur at the same time. If a considerable quantity of arsenious acid, such as an ounce or an ounce and a half, or more, is treated with a corresponding quantity of diluted muriatic acid, then, on shaking the vessel, if the right moment be seized, the emission of light from the shooting of the crystals is so powerful that a dark room may be lighted up by it.

Considerable time elapses before the acid solution of arsenious acid leaves off depositing crystals, consequently the cooled solution still continues to emit light on the second and even on the third evening, but only extremely feeble, and only when it is agitated. It is, however, impossible after this to produce any emission of light; a proof that it is occasioned by

* Read to the Academy of Sciences at Berlin, July 30, 1835.

the shooting of the crystals, and not by electricity of friction. If the hot solution of the transparent arsenious acid is allowed to cool rapidly, whereby a friable mass of arsenious acid is obtained; then either a very feeble light or none at all can be observed. Equally little light is observable if the transparent acid is treated with acetic or nitric acid, the latter either of the common strength or fuming. The reason of this is simply that these acids dissolve but very little of the arsenious acid, especially the acetic acid, so that this solution is but slightly tinged yellow by sulphuretted hydrogen, without any sulphuret of arsenic being precipitated. Dilute sulphuric acid, on the other hand, dissolves rather more arsenious acid by boiling, and if this solution be allowed to cool very slowly, a feeble light may sometimes be observed. If a large quantity of the transparent arsenious acid is treated with only so much nitro-muriatic acid (which, however, must contain an excess of muriatic acid) that it is not completely dissolved and oxidized to arsenic acid, a strong light is then observed on cooling.

The cause of the luminosity of crystals during their formation has long appeared to me to be this: that the substance which separates from a fluid in the form of a luminous crystal is not contained as such in the solution, but that it is only formed when the crystal is formed, and that the appearance of light is necessarily conditioned by the formation of a new substance in a crystalline state.

The light evolved during the crystallization of substances has most frequently been observed with sulphate of potash, but always only casually, and never during the recrystallization of pure sulphate of potash; but, as I believe, merely during the crystallization of the solution of the residue from the preparation of nitric acid. This contains almost always sesquisulphate of potash, which as such is soluble in water, but which, according to Phillips, is decomposed whilst crystallizing into bisulphate and neutral sulphate of potash; and the latter becomes luminous during crystallization, whilst it is formed in the fluid, and crystallizing out of it.

Two isomeric states of the arsenious acid are commonly

known: it is either transparent and vitreous, or porcellaneous and opaque. At first, after melting, it is quite transparent, but simply by keeping it, and without its experiencing any increase of weight, it becomes milk-white and opaque. In both states the acid has different specific gravity and solubility in water.

I have only been able to observe the evolution of strong light during the crystallization of the arsenious acid, when I treated the vitreous acid with muriatic acid in the above mentioned manner. In the same manner the opaque acid and also the pulverulent arsenious acid, which is obtained by sublimation during the roasting of the arsenical ore, and which is known in commerce under the name of "Giftmehl,"* when treated with muriatic acid did not produce, even by the most gradual cooling, any light, and it was only by shaking the vessel that a very feeble light was visible; in the latter case most likely because the opaque acid contained still some portions of the vitreous acid. But this feeble light could never be compared with the strong light which was visible when the transparent acid was employed. The light evolved during the shooting of the crystals of the arsenious acid appears, therefore, to depend upon this,—that the solution of the transparent acid is changed by crystallizing into the opaque or porcellaneous kind. The crystals produced belong, therefore, to the opaque modification; and the change of the transparent into the opaque acid is caused by nothing else than the transformation of the acid from a completely uncrystalline to a crystalline state.

The crystals of arsenious acid which are obtained from a very slowly cooled solution in muriatic acid are, however, transparent; but this transparency is caused only by their size, and an aggregate of very small crystals of the acid would exhibit an opaque appearance. The crystals formed were always regular octohedrons, and did not possess the form ob-

* The suboxide of arsenic of Berzelius.

served by Wohler, which is, perhaps, a third isomeric modification of arsenious acid.

If the transparent acid is treated in the above mentioned manner and proportions, and the crystals have been formed accompanied by phosphorescence, and the whole been allowed to cool perfectly, the phosphorescence can be obtained once more, and sometimes even very powerfully, if the whole is again heated to the boiling point and slowly cooled. However, the light is much more feeble than that first observed, and is only caused by the muriatic solution still containing portions of the transparent arsenious acid, and which, during crystallization, evolves this feeble light. Moreover, the quantity of dilute muriatic acid in the mixture above described is not sufficient to dissolve all the arsenious acid; and there remains, therefore, a small portion in the vitreous state.

But still the appearances of light which have been observed cannot be explained on the principle of a new arrangement or formation, and I myself hold this hypothesis to be one which requires the evidence of more facts to establish its probability. Thus, Berzelius observed phosphorescence during the crystallization of fluoride of sodium out of a solution which held the same salt already in solution.

Arcana of Science.

ART. XXIV.—PREPARATION OF HYDROCYANIC ACID OF UNIFORM STRENGTH.

By Thomas Everitt, Esq., Professor of Chemistry to the Medico-Botanical Society.

The best proportions of the ferrocyanuret of potassium and sulphuric acid to be used when we want hydrocyanic acid, are as follow:—

To every 212.47 grains of the crystals dissolved in about two fluid ounces of water, add so much dilute sulphuric acid as shall contain 120 grains of real acid, and, by conducting the distillation carefully, 41 grains of hydrocyanic acid pass off, and that I find with the first third of the water; of course water must be put into the receiver and kept very cold. But no process for procuring a dilute solution of hydrocyanic acid, in which distillation or filtration is had recourse to, will yield an acid of uniform strength, however carefully the process may be conducted, not even, as I have proved, if the receiver be surrounded with ice. Hence the *absolute necessity* of assaying in all such processes the ultimate product, either by the nitrate of silver or the peroxide of mercury method; the first is to be preferred: we have the great advantage that any error committed in collecting, drying, and weighing, is reduced to one-fifth in estimating the quantity of real acid, 100 grains of the cyanide of silver corresponding to 20.38 of hydrocyanic acid.

In addition to the very elegant application of the nitrate of silver for detecting the presence of free hydrocyanic acid in its passage as vapour from a dilute solution, or any plant containing the acid (thus, masticate a bitter almond, put in a watch glass, and cover it with a bit of glass, on the under surface of which a drop of dilute nitrate of silver is placed; in a few minutes the cyanide of silver is formed—an experiment which may serve as a class illustration of the extreme volatility of the substance), recommended by Mr. Barry in the London and Edinburgh Philosophical Magazine, vol. iv., p. 151, (or

Repertory, New Series, vol. i., p. 178—181, in the number for March, 1834). Mr. Barry has also put me in possession of a means as elegant for the testing of the presence of minute quantities of hydrochloric or sulphuric acid in hydrocyanic acid, viz.: put some of the acid on a watch glass, add two or three drops of *liquor ammoniæ*, put the glass on the sand bath and evaporate to perfect dryness, when all ammonia and hydrocyanic acid pass off, leaving only, if any hydrochloric or sulphuric acid be present, a little hydrochlorate or sulphate of ammonia behind; a drop or two of distilled water will dissolve these, and by nitrate of silver added to one half, and nitrate of barytes to the other, the presence or absence of the above acids will be determined. If the hydrocyanic acid be quite pure, the watch glass, after evaporation, is scarcely soiled, and water dissolves nothing: this method is far preferable to that by means of carbonate of lime usually recommended.

In a paper which I read to the Medico-Botanical Society, on Thursday, December 9, 1834, on the methods of assaying medicinal hydrocyanic acid, I stated that I had examined samples of the acid procured from various shops in town, and that the frightful difference of strength had induced me to make the results known, with a view of calling the attention of the medical profession to the evil. Thus, samples from Allen, Hanbury & Co., yielded 5.8 per cent.; from Apothecaries' Hall, at different times, from 2.1 to 2.6 per cent.; and from several sources I found acid containing only 1.4 per cent. These samples I procured from the several shops personally, and asked for Scheele's strength. They were assayed within 24 hours after they were in my possession, both by the nitrate of silver, and the oxide of mercury method, and the results in no cases varied more than 1.10th of a grain from each other. Now it is true we have no fixed standard, and therefore it is impossible to say whether Allen & Co.'s is too strong or the others too weak; but thus much is certain, that if a medical man were pushing the exhibition of hydrocyanic acid gradually to a maximum dose, the prescriptions being carried to a shop where the acid had only 1.4 per cent., and

then, by some accident or other cause, taken to where Allen's acid was used, a sudden, and I fear, a fatal increase would be the result, for more than a triple quantity would be taken. For the possibility of a fatal accident I need only refer to the case of seven individuals near Paris being killed by a slightly increased dose, recorded in all the medical periodicals a few years since.

On the same evening I called the attention of the members of the Medico-Botanical Society to the method for procuring medical hydrocyanic acid recommended by Dr. Thomas Clarke, by cyanide of potassium and tartaric acid; a method which can now be employed by any one, since Mr. Laming has brought into the market a very pure salt. From very numerous trials, I find that the procuring of this salt, the cyanide of potassium perfectly pure, must be expensive, and I have never been able to procure it strictly in this state without using alcohol to crystallize it from; and many chemists, I find (see Mr. Barry's paper above alluded to) object to it, from its being so excessively deliquescent, and hence rather unmanageable, and also to the liability of this highly poisonous salt being mistaken for other white salts on their counters. This latter objection, I must say, is hypocritical: if people will be careless there is no means of preventing mistakes, and I conceive the objection of Mr. Barry applies with tenfold force to many arrangements of a druggist's shop, where we often see tincture of opium flanked right and left by other dark tinctures; and who that has manipulated has not caught himself laying hold of, and using one acid, &c. for another, when the mind is also at work?

I have made many trials as to the practicability of applying the cyanide of silver and dilute hydrochloric acid for procuring medical hydrocyanic acid. The cyanide of silver presents many advantages: it is perfectly stable, being neither affected by light nor moisture; its purity can be very easily ascertained, and every five grains of it will yield one grain of acid. It can be procured by conducting the vapour from the process described above into a pint of water, holding 255

grains of nitrate of silver, washing and drying at 212°. It yields 201.6 grains of white cyanide. I should recommend that the bottle containing this salt be accompanied by a small stoppered phial with dilute hydrochloric acid of such strength that one minim will exactly decompose one grain of the cyanide: thus, suppose one corked phial having 200 grains of cyanide, with an half ounce stoppered bottle with hydrochloric acid of specific gravity 1.129, this would be enough to make five fluid ounces of dilute hydrocyanic acid of the Dublin strength, if the following formula be followed:—Into a phial capable of holding rather more than one fluid ounce, put 40 grains of the cyanide, add 7 fluid ounces, 20 minims of water, and 40 minims of the dilute hydrochloric acid; cork closely, shake several times for the first quarter of an hour, set aside to allow the chloride of silver to fall, decant the clear liquid into another bottle to be preserved for use: every fluid drachm will contain one grain of real hydrocyanic acid.

The only objection I had *a priori* to this process was the liability of a little free hydrochloric acid remaining in the solution, since all books echo that the presence of a minute quantity of the mineral acids very much hastens the decomposition of this acid: a statement perfectly opposite to fact, at least as far as concerns hydrochloric acid. I prepared 4 ounces of hydrocyanic acid perfectly pure by distillation of chalk; to 2 ounces I added 5 drops of hydrochloric acid; the other 2 ounces in another phial were left perfectly pure, both inverted and placed in a glass case so as to have diffused light during the day. After three weeks the pure acid had become quite brown, and a considerable quantity of solid deposit had formed; the other remained quite limpid and colourless, and, on actual trial, was found to contain 19.20ths of the acid which it had at first. Mr. Barry also informed me that his fourteen years' experience led to the same result; and that being aware of this, he adds purposely a little hydrochloric acid to all his medicinal acid. Perhaps some may object to the price of the preparation: a case containing the two bottles with 200 grains of the cyanide would leave one-

half profit if sold for five shillings; this brings an ounce of acid to one shilling, and where so small a quantity is used, surely this cannot be a very weighty objection, if a uniform article can be secured. *Arcana of Science.*

MINUTES OF THE COLLEGE OF PHARMACY.

January 26, 1836.—The committee on Patent Medicine Directions, made a report which was accepted, and the committee continued.

Letters of resignation from M. Pleis, John Elliot and Thomas M'Clintock, were read and accepted.

A communication from W. & L. Krumbhaar in relation to an article by W. L. Rushton, published in No. I., Vol. VII., Journal of Pharmacy, on an adulteration of acetate of morphia, requesting the College to appoint a committee of investigation, with instructions to report at the next stated meeting. The whole subject was referred to the Committee on Equity, with instructions to report in writing to the College.

The resignation of Stephen Proctor, through Dillwyn Parrish, was duly accepted.

February 23.—The Committee on Equity, to whom was referred a communication from W. & L. Krumbhaar, reported progress, and were continued.

The propriety of publishing a list of the members of the College being under consideration, it was resolved that the subject be referred to a special committee, with instructions to report their views, together with a correct list of all members of the institution.

March 29.—The Board of Trustees reported the election of Jos. Trimble and Richard Price as resident members, and also that Joseph M. Turner, John Simes and Henry C. Blair hav-

ing complied with the requisitions of the School of Pharmacy, passed a creditable examination before the Professors and Committee appointed by the Board, have been duly declared graduates in the Philadelphia College of Pharmacy. The Committee to whom was referred the subject of preparing and publishing a correct list of the members of the College, made a report, which was acepted, and the following resolutions proposed by them, adopted:

That 250 copies of the List of Members be printed in a handsome type on good paper, and that each Resident, and as far as practicable, each Associate and Honorary Member be supplied with one, at the expense of the College.

That the revised list be also published as an addenda, and bound with the next number of the American Journal of Pharmacy, and also that the same be published three times in three of the daily papers.

That the Board of Trustees be directed to revise the list of members once in every two years, and have it published as above ordered.

The Committee on Equity, to whom was referred the communication of W. & L. Krumbhaar, in relation to adulterated acetate of morphia, made a report which was read, and referred back to the committee, with instructions to correspond with N. Cance, of New York, on the subject, and to report at the next meeting.

The Publication Committee made their annual report, showing a balance in their favour of $355 00, besides the stock of Journals on hand, which was accepted.

The College then went into the annual election for officers, when the tellers reported the following as duly chosen:

President—D. B. Smith.

Vice Presidents—Henry Troth, G. B. Wood, M. D.

Recording Secretary—Charles Ellis.

Corresponding Secretary—Elias Durand.

Treasurer—Edward B. Garrigues.

Trustees—Warder Morris, Edward Roberts, Richard M. Reeve, Thomas H. Powers, R. E. Griffith, M. D., John C. Allen, Dillwyn Parrish, John Bringhurst.

Publishing Committee—D. B. Smith, G. B. Wood, M. D., F. Bache, M. D., Charles Ellis, Joseph Scattergood, John C. Allen, William Hodgson, jr., Elias Durand, Dillwyn Parrish and R. E. Griffith, M. D.

June 28.—A communication from Drs. Wood and Bache was read presenting the third edition of their Dispensatory, for the Library of the College. It was resolved that the same be accepted, with the thanks of the College.

Letters of resignation from Henry M. Zollickoffer and Thomas C. Percival were read and accepted.

A valuable collection of Botanical Specimens of dried plants, arranged with much care, and in a perfect state of preservation, with catalogues, was presented by R. Peter, M. D., Professor in the Medical College, Lexington, Ky. It was, on motion, Resolved, that the thanks of this College be presented to Professor Peter for this valuable addition to their Cabinet of Specimens, and that the Secretary be directed to communicate to him, on behalf of the College, a copy of this resolution.

A report from the committee appointed last year, on Latin Labels, was read. These labels are arranged according to the nomenclature of the United States Pharmacopœia and other standard authorities, and are published in books neatly executed on coloured paper, for the use of Druggists and Physicians. The committee have found it necessary to publish a second edition, and have secured the copyright to the College. They conclude their report with the following:

Inasmuch as it is to the labours of our fellow members Tyson & Fisher, of Baltimore, that we chiefly owe this book of Latin Labels, therefore the committee have the pleasure of offering the following resolution:

Resolved, that the thanks of the College, with 12 copies of these Labels, be presented to Tyson & Fisher.

The following report from the Committee of Equity was read and adopted:

To the Philadelphia College of Pharmacy.

The Committee of Equity to whom was referred the communication from W. & L. Krumbhaar, requesting an investigation how far they were accessory to the manufacture and sale of a certain article sold by them to Rushton & Aspinwall, of New York, as Acetate of Morphine, knowing it to be impure, respectfully Report,

That, they have given diligent attention to the subject referred to them, and after the examination of several disinterested persons and others, are unanimously of the opinion that the article said to be Acetate of Morphine, and sold by W. & L. Krumbhaar to Rushton & Aspinwall, of New York, was not a genuine article, but that W. & L. Krumbhaar did not know at the time they sold it that it was not good and genuine.

Respectfully submitted.

EDWARD B. GARRIGUES,
PETER LEHMAN,
JACOB BIGONET.

Fourth Mo. (*April,*) 25, 1836.

A communication from Tyson & Fisher to the Publishing Committee of the American Journal of Pharmacy, presenting their annual statement of the concerns of the Journal under their charge, was laid before the College, whereupon it was Resolved, that the Secretary be directed to present to Messrs. Tyson & Fisher the thanks of this Institution for their efficient and disinterested management of the Journal in the city of Baltimore.

MISCELLANY.

Bromine.—M. Barruel has recently discovered a new method of obtaining bromine from a substance hitherto not used for this purpose; this process is so simple and affords so large a product that he can furnish several hundred of pounds a month, at a price not exceeding ten dollars the pound. *Cottereau. Pharmacologie.*

Calcined Magnesia.—It is generally believed that calcined magnesia absorbs carbonic acid, with some rapidity, from the atmosphere, and hence that it should be kept in well closed vessels. M. Cottereau, however, states that it may be preserved for years, in bottles merely stopped with a cork, without becoming deteriorated in the slightest degree.

Ibid.

Lactic Acid.—According to MM. Pelouze and Gay Lussac, this acid may be prepared perfectly pure by the following process. Beet roots are to be subjected to pressure, and the juice thus obtained suffered to ferment for two months at a temperature of 75° to 85° F., and then evaporated to the consistence of a syrup, which will be found filled with innumerable crystals of mannite. The whole is to be treated with alcohol, which dissolves the lactic acid; this solution is to be evaporated to dryness, and the residue dissolved in water, and saturated with carbonate of zinc, which causes a large precipitate; the whole is then to be filtered and evaporated to obtain the lactate of zinc. This salt is to be dissolved in water and purified with animal charcoal and a recrystallization. These crystals are to be washed with boiling alcohol, and then successively treated with barytes and sulphuric acid, to separate the lactic acid. This is to be concentrated *in vacuo*, and dissolved in sulphuric ether to get rid of any foreign matter, the solution being filtered and evaporated, will give the acid in a pure state. *Ibid.*

Conеine.—In a letter from Dr. Christison to M. Robiquet, he states that he treated 40 pounds (avoirdupois) of conium seeds, according to the process of Geiger, and obtained three ounces two drachms of a tolerably

fluid oil. This oil, he adds, is the true active principle of the plant, and is one of the most virulent poisons known, having a strong analogy to strychnine. It causes death by asphyxia, from paralyzing the muscles of respiration. The heart is not affected, and the senses are perfect as long as respiration continues. This deleterious action is not modified, as Geiger, supposes, by acids; on the contrary, coneine is rendered even more active by combining it with hydrochloric acid.

Journ. de Pharm.

New Acid.—M. Robiquet presented to the Society of Pharmacy at the meeting of the 3d February, a new acid which he had obtained by treating gallic acid with sulphuric acid. On heating the former with the latter, till sulphurous acid begins to be disengaged, the sulphuric acid assumes a bistre colour; if it then be poured in water, two precipitates are formed, one flocculent, the other crystalline and reddish; this latter is capable of saturation with alkalies; sublimes in yellowish or red crystals; is insoluble in alcohol and ether. *Ibid.*

Henderson's Collyrium in amaurosis.—

℞.	Strychnia,	gr. ij.
	Dilute acetic acid,	ʒi.
	Distilled water,	ʒi.

A few drops of this collyrium, applied to the eye, several times a day, is said to have a beneficial effect in amaurosis. *Ibid.*

Guaiacic acid.—M. Bighini announces that he has discovered a new acid in the *Guaiacum officinale*, combined with a fat volatile oil. To obtain the acid, he advises the oil to be mixed with peroxide of manganese, and this compound decomposed by diluted sulphuric acid; the new acid is precipitated. It is soluble in alcohol, and may be purified in the same way as benzoic acid. The resin of guaiacum affords a fluid on distillation, the smell of which resembles that of creosote; its taste is pungent, and when properly treated it furnishes pure creosote. *Ibid.*

Proportion of Ashes in different parts of Wood.—A portion of heart wood, of sap wood, and of intermediate layers of the trunk of an oak of sixty years of age, which had grown in a sandy loam, were separately burned. The heart yielded .27 per cent. of ashes, the middle layers .34 per cent., and the sap wood .532 per cent.—*Ibid. and Ann. des Mines.*

Tannate of Gelatine for taking Casts from Medals, &c.—This substance is obtained by adding a decoction of gall nuts, sumach, oak bark, or other substance containing tannin, to a solution of glue or isinglass, in water. It is fibrous and nearly insoluble. When exposed to the air in thin layers

it hardens; when moist, it is elastic. The material which was found to give the best mixture for casts, was finely pulverized slate. Silica, emery, &c., give pastes which harden, and may be used for razor strops. In making casts of the mixture of tannate, of gelatine, and pulverized slate, it must be left for a certain time in the mould, in order to preserve the impression. If, however, it is allowed to remain there too long, it adheres strongly. The only difficulty in the application, is to ascertain the precise time required for due hardening.

Journ. Frank. Inst. and Journ. Conn. Usuelles.

Orange and Lemon Syrups.—The following recipes, it is said, will afford syrups that possess the same flavour as those made with the fresh fruit:

1. *Tincture of Orange Peel.*

Fresh orange peel, the inner white portion being entirely removed.
Alcohol at 22° sufficient to cover the orange peel.

Introduce into a glass stoppered bottle, and keep in a cool place.

2. *Tincture of Lemon Peel.*

Fresh lemon peel, the white portion removed.
Alcohol at 30°, q. s.

Prepare as before.

3. *Artificial Orange Juice.*

Citric acid,	ʒss.
Distilled water,	℥iv. Dissolve and add,
Tincture orange peel,	ʒij.

4. *Artificial Lemon Juice.*

Citric acid,	ʒij.
Distilled water,	℥iv. Dissolve and add,
Tincture lemon peel.	ʒiss.

5. *Orange Syrup.*

Citric acid,	ʒiv.
Distilled water,	ʒij. Dissolve and add,
Simple syrup,	lb. viij.
Tincture orange peel.	ʒij.

6. *Lemon Syrup.*

Citric acid,	℥iss.
Distilled water,	℥iv. Dissolve and add,
Simple syrup,	lbs. viij.
Tincture lemon peel,	ʒiv.

Ibid.

Hunt's Writing Ink.—

Powdered galls,	lbs. viij.
Rasped logwood,	lbs. iv.
Gum Arabic,	lbs. iij.
Sulphate iron,	lbs. iv.
Sulphate copper,	lb. j.
Sugar candy,	lb. j.
Gum ammoniac,	℥ij.
Distilled water,	O xvj.
Alcohol,	O ss.

Macerate for forty-eight hours with heat, and after ten days draw off the ink into bottles. *Journ. de Conn. Usuel.*

Antiphlogistic Syrup.—The following syrup has been much used in Paris in chronic catarrhs, rheumatism, &c.:

Jujubes, dates, figs, raisins,	aa	℥ss.
Pectoral flowers,*		℥ij.
Poppy flowers,		℥i.
Gum Arabic,		℥iij
Mucilage of marsh mallows,		℥ij.
Mucilage of flaxseed,		℥i.
Orange flower water,		℥ij.

White sugar and distilled water q. s. for lb. ij. of syrup.

Make a decoction of the fruits, strain and boil; add an infusion of the flowers and again strain, then add the mucilages, sugar, &c. and form a syrup. *Ibid.*

Decolouration of Oils.—M. Piussan, apothecary of the hospital of Oleron, states that oil bleached by being placed in contact with animal charcoal for twenty four hours, was used in the preparation of an ointment; this was beautifully white, but was much less consistent than that made with the crude oil. Olive, poppy and almond oils, thus treated, remain so fluid, that they require a fifth more of wax to give them a proper consistence. They do not concrete at a much lower temperature than that at which they congeal in their ordinary state, and hence may be advantageously employed by watch-makers. *Ibid.*

Palm Wax.—The wax of the Ceroxylon andicola, when melted, is of a dark yellow, somewhat transparent; it is almost as brittle as resin, but at the same time has a wax-like fracture. It melts at a temperature a little

* The pectoral flowers are those of the Mallow, Althea, Gnaphalium, Tussilago, Violet, and Red Poppy.

over that of boiling water; becomes electric by friction, burns with a bright flame, but gives out much smoke. Alcohol and ether readily dissolve it with the assistance of heat; the caustic alkalies act on it with difficulty, but finally dissolve it. If it be treated with a great excess of boiling alcohol, a resinous principle can be separated, which, on cooling, remains in solution in the alcohol, whilst the wax precipitates. This purified wax melts at a temperature below that of boiling water, and presents all the physical and chemical characters of bees-wax. The resin is of a dazzling whiteness, and its structure is evidently crystalline. When it is melted, it has the colour and aspect of amber. It is soluble in alcohol, but much more so in hot than in cold. It is also soluble in ether and in the essential oils. M. Boussingault gives as its composition, C.40, H.32, O. *Journ. de Pharm.*

Size for Painting in Water Colours.—

Isinglass,	℥ij.
White soap,	℥ij.
Alum,	℥iss.

The isinglass, cut into small pieces, is to be swelled in a little tepid water for some time, and then dissolved with the assistance of heat in from four to eight ounces of water, and the alum and soap finely powdered and gradually added; the whole is to be well stirred, aud a drachm of spirits of wine added by very small portions at a time.

Journ. de Conn. Usuelles.

Creosote.—M. Koene finding that wood tar furnished only a minute proportion of pure creosote, and that what other chemists have pretended to have procured from this source was nothing more than a peculiar heavy oil, merely impregnated with creosote, tried other sources, and by operating in the following manner, obtained ten drachms from a quart of coal tar. He distilled the tar in a retort furnished with a long adapter with a large mouth, under which he placed a capsule. He obtained, at first, a light volatile oil, and at last a heavy oil; he continued the distillation, raising the temperature until napthaline began to concrete in the neck of the retort; there remained in the adapter a certain portion of heavy oil, united to napthaline, of a butyraceous consistence, which he disengaged by slightly heating the adapter. This was mixed with the last mentioned oil and exposed to cold to separate the napthaline. To obtain all the creosote, he heated this napthaline with its own weight of pyroligneous acid. On cooling, the napthaline crystallized, and could be wholly separated from the fluid, which was saturated with carbonate of potash. The heavy oils were treated successively with one-fortieth of their weight of phosphoric acid and their own bulk of water. The water was separated, and the oil distilled, the light oil which comes over first being rejected.

The rectified oil was dissolved in potash, and the free creosote separated by means of a slight excess of diluted phosphoric acid; again distilled, and on the rejection of the water which first passed over, pure creosote was obtained. *Journ. de Pharm.*

Ointment for the Itch.—Dr. Lison, physician of the Hospital of Donzi, speaks in high terms of the efficacy of the following ointment in itch:

R.	Litharge,	℥i.
	Olive oil,	℥iv.

Mix and heat over a moderate fire, stirring continually, till the ointment acquires a slightly blackish colour.

Journ. Gen. de Therap. and Am. Journ. Med. Sci.

Syrup of Punch.—

	Simple syrup,	lbs. xxiv.

Evaporate rapidly to 20 pounds, and prepare an infusion of

	Green tea,	℥ij. in
	Boiling water,	℥xvj.

Mix this infusion with the syrup in a closed vessel, and add

	Rum,	lb. vj.
	Alcohol 36°,	lb. ij.
	Citric acid,	℥i. dissolved in water, ℥iv.
	Tinct. of lemon peel,	℥iss.

Mix, and when cold, put in bottles and keep in cool place.

Journ. de Conn. Usuelles.

Action of Nitric and Sulphuric Acids on some Organic Substances.—M. Couerbe observes, that, struck with the analogous properties of narcotine and thebaine, (paramorphia) he endeavoured to discover what were their differential characters. He found that narcotine, when placed in contact with cold nitric or sulphuric acid, underwent no change of colour, but that when it was subjected to the action of a mixture of these acids, it assumed a beautiful blood-red tint. This is so sensible a test, says he, that with the assistance of narcotine, the presence of a single drop of nitric acid can be detected in one or even two pounds of sulphuric acid. He satisfied himself that this production of colour was owing to the disengagement of oxygen by the reciprocal action of the two acids, and that the same phenomenon can be produced by passing oxygen through a mixture of narcotine and sulphuric acid. By employing the protoxide of azote instead of oxygen, an analogous result is obtained, but the colour is less vivid, whilst with atmospheric air, the reverse is the case. M. Couerbe subjected the immediate principles of opium to the action of his new reagent, by violently agitating six grains of each substance with above half an ounce of the acid mixture, with the following results:

Thebaine.—Instantly reddened, becoming darker with time, presenting a yellowish reflection when examined in thin layers.

Narcotine.—First changed to a yellow, but after the lapse of a few minutes, (7 to 8) becoming red.

Codeine.—First becoming of a faint green, then changing to violet green.

Morphia.—Almost immediately assuming a brown red.

Meconine.—At first no change, but in twenty-four hours becoming of a rich rose colour.

Narceine.—Immediately changing to a mahogany red colour.

Journ. de Pharm.

Analysis of Pyrethrum.—M. Koene has found this root to contain 1st, a brown, very acrid substance, of a resinous appearance, insoluble in caustic potash 0.59; 2d, a fixed oil of dark brown colour, very acrid, soluble in potash 1.60; 3d, a yellow acrid oil, soluble in potash 0.35; 4th, traces of tannin; 5th, gum 9.40; 6th, inuline; 7th, sulphate, hydrochlorate and carbonate of potash, phosphate and carbonate of lime, alumine, silex, &c. 7.60; 8th, woody fibre 19.80—loss 2.60=100. *Ibid.*

Rhus radicans.—G. Sella recommends the Rhus radicans as an excellent dye. For eight parts of wool, take of this plant, previously boiled, eight parts, alum one part, cream of tartar one-sixth part, muriatic acid solution (muriatic acid four parts, pure tin one part) 1 part. Boil for three-quarters of an hour; a fine yellow is produced. If the dried plant be used, a pale yellow or hazel colour is obtained. These colours resist soap and the sun as well as the other yellow colours. It becomes more stable if allowed to remain for twelve hours in the vat.

Arcana. Science.

New method of drying Plants.—Dr. Hunfeld has announced a new method of drying plants, by covering them first with powder of lycopodium, and then placing them in a vessel containing chloride of calcium. By this method the colour and flexibility are retained. On the 29th July, 1831, Dr. Goppert of Breslaw, placed in a 24 ounce glass, two leaves of the hyacinth, and a specimen of the *Fumaria officinalis*, with two ounces of chloride of calcium, in such a manner that the plants were not in contact with the salt; on the following day the leaves began to dry, and on the 3d of August, although not dead, the hyacinth leaves could be reduced to powder. Even succulent plants, as the *Sedum rupestre*, are so much dried in a week that they may be powdered. The use of the lycopodium is to prevent the sap from escaping. *Ibid.*

Crystallized oxychloride of Mercury.—M. Malagutti states that when a large proportion of water is added to an acid solution of protochloride of antimony, an abundant white precipitate is immediately formed, which when properly washed consists of two atoms of protoxide and one atom of protochloride of antimony; if, on the contrary, instead of removing the precipitate, it is left in the fluid for a day or two, it becomes much diminished in size, and is finally converted into thick and crystalline layers. This new compound, when washed and dried, is in the form of small prismatic needles, white, shining and decomposed into pure oxide of antimony, by boiling in water, by prolonged washings, and by the alkaline carbonates. These crystals are wholly soluble in nitric acid, and when subjected to the action of heat, lose most of their chlorine. On analysis they were found to be composed of:

Protoxide antimony,	74.51
Protochloride antimony,	25.70

When sulphuret of antimony is treated with hydrochloric acid, somewhat diluted with water, in order to obtain sulphuretted hydrogen, the fluid above the unattacked sulphuret becomes red on cooling. If this fluid be decanted and mixed with a great quantity of water, a very copious, yellowish precipitate is obtained, which in a few days is reduced to a thin layer, formed of minute crystals of a beautiful red colour. M. Malagutti subjected these crystals to analysis, and found that they were oxychloride of antimony, coloured by variable quantities of sulphuret of antimony. It was even easy, on examining them with a microscope, to discover that the colour was owing to a foreign body, unequally distributed between the crystals.

Journ. de Pharm.